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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. X.—No. 1.]

JANUARY, 1914.

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"Coco-nuts—the Consols of the East."

THE SECOND EDITION PUBLISHED.

WE can now greet our readers with the pleasing intelligence that the Second Edition of the above book is now ready, and by the time these words see the light our orders covering two or three hundred copies will either have been despatched, or be in the process of being sent off as rapidly as possible. Our many friends, therefore, who tried unavailingly to obtain a copy of the first edition will now be able to "tap" the resources of the second edition, which we have no hesitation in describing as the very last word on the cult of the coco-nut. Publication has been delayed unavoidably, as the extra sections that have been added necessitated a great deal of careful "spade work," and the fact of the balance of the book having been brought up to date in every detail has also involved a vast amount of unexpected detail work, which, however, has now been accomplished satisfactorily. We congratulate both our subscribers and ourselves on so successful an outcome to our labours.

Greetings and Souvenirs Sent to "Tropical Life."

OUR FRIENDS REMARK ON OUR PROGRESS DURING 1913.

FOLLOWING on the short paragraph with which we started our December issue, wishing our subscribers, supporters and friends generally the Compliments of the Season, we have now to acknowledge many kindly messages and little souvenirs sent in return. Their receipt gives us much pleasure; it is not the gift but the giving that we have liked so much right through; and we beg to tender our best thanks to all for same.

Of Messrs. Burroughs Wellcome and Co.'s "Photographic Exposure Record and Diary" for 1914, we can only say that if brevity be the soul of wit condensation is the essence of literature; especially is it so in these hustling days, when leisure is with many people reduced to a minimum quantity, and this guide to photography condenses into one small volume clear, definite and precise instructions on a very wide range of subjects. Development, toning, fixing, printing, the various processes of production in warm tones and colours, and the methods of dealing with errors of technique are explained, particular attention being directed in the 1914 edition to green and blue toning and the production of various colours by development and other methods. On the subject of exposure this book is the last word. As usual, three editions of the Record and Diary are published, and may be obtained

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from all photographic dealers and booksellers and at all railway bookstalls. Price in the British Isles, 1s.

Two of our departments are busily spoiling the surface of the large blotting-pads issued by the Nobels Explosives Company, of Glasgow, which, with their capacious and handy calendar diary at the side, proved so useful to us during 1913. The receipt of two copies this year was naturally, therefore, hailed with delight.

The now well-known leather-covered pocket-book, with useful pockets, plenty of writing space, and welcomed details of general information from our old friends, the Atlas Preservative Co., Ltd., duly appeared on the editorial desk, so also did a somewhat similar book from Messrs. David Bridge and Co., Ltd., of rubber machinery fame, who are also the sole makers of the much discussed Wickham Patent "Hard-cure" process rubber machine. Whilst we were admiring same the head of the art department bespoke the first, and our chief book-keeper the second, so that any danger of overlapping was removed, and good use has already been made of the books, the present owners having had a taste of their utility before. In front of us hangs an attractive calendar of Messrs. Dolberg, the light railway engineers, whose lines are making such rapid headway through the Tropics and elsewhere that the London office has had to take more commodious premises at Balfour House, 119-125, Finsbury Pavement, E.C. Copies, so long as available, will be sent to readers of TROPICAL LIFE on receipt of a postcard asking for same. Close by hangs another almanac, which, in compliment, no doubt, to the completion of the Panama Canal, is adorned with well executed illustrations in colour by Mr. F. L. Blanchard, of Cortez, staring with eagle eyes at the newly discovered Pacific, now linked up with the Atlantic, whilst below is an excellent representation of a pioneer ship of that period, such a one as Cortez, Balbao, Pizarro, or other of the *Conquistadores* used in their journeys between the Old World and the New. For this we are indebted to Messrs. Scrutton Sons and Co., Ltd., whose steamers have trafficked between here and the West Indies and the Spanish Main for many years.

Messrs. Francis Shaw and Co. also sent greetings, and at the same time notified us that their London address has been changed to 10A, Mark Lane, E.C., which alteration our readers will doubtless take good note of.

Not the least welcome of our letters was the following from the manager of the Chilean Nitrate Committee, who writes: "I enclose order for another twelve months, on same terms as before, for TROPICAL LIFE, and take this opportunity of thanking you for your valuable co-operation, and for the interest you always take in our propaganda work. TROPICAL LIFE has certainly expanded very considerably during the past twelve months, and I wish you continued success and a Prosperous New Year."

Mr. H. J. Rudolf, a prominent cacao planter, and one of our oldest subscribers in Jamaica, as he points out, now writes asking us to send a copy of the Journal to each of his two sons, and at the same time he tells us: "Your coco-nut articles are very interesting, as are those on cacao and rubber. I believe I am one of the first to take in TROPICAL LIFE in Jamaica, and have always found it good reading."

Reviews.

THE BANANA: ITS CULTIVATION, DISTRIBUTION, AND COMMERCIAL USES. By W. Fawcett, B.Sc., F.L.S., ex-Director of Plantations, Jamaica. With an Introduction by Sir Daniel Morris, K.C.M.G. Published under the auspices of the West India Committee. Pp. 287, many full-page and other illustrations. 7s. 6d. net, or 8s. post free. The West India Committee, 15, Seething Lane, London, E.C., or Duckworth and Co., Henrietta Street, Covent Garden, London, W.C., also obtainable at TROPICAL LIFE, 83-91, Great Titchfield Street, Oxford Street, W.

According to the *West India Committee* Circular, the world will one day wake up and find out that it can no more do without the banana than it can give up tobacco, tea, or rice. We agree with this opinion, and believe that once planters at the large producing centres as Jamaica, Costa Rica, &c., can organize and erect central factories for the manufacture and utilization of the by-products of the banana-plantation industry, satisfactory as profits now are—and Mr. Fawcett, in Chapter IX, on the Cost of Cultivation and Receipts, of the book under review, shows that these are already substantial—Jamaica and the other centres could still give, in wages and profits, further considerable sums in addition to what they are already gathering in from their banana fields.

We hope that in the near future this will be so, both on account of the increased spending capacity the Tropics generally, and our own West Indian possessions in particular, will secure, as well as for the undoubted benefit and pleasure, large, regular supplies of bananas confer upon the consumers, for, as Sir James Crichton-Browne says on p. 107 of Mr. Fawcett's book, "The banana . . . contains . . . all the essential elements of nutrition. . . . The Jamaica banana is, in the guise of a cheap luxury, a substantial addition to our food supply, which is certain more and more to commend itself to the working classes in our large towns." More recently the same great authority on our food supply wrote further, and in quoting his remarks we would ask our readers to note the first word in the following sentence, since it proves a continued experience that goes to confirm those he had already formed. "Extended experience of the banana has deepened my conviction of its food value. It is a great boon to the masses of our people, and while retaining its place on the dessert table of the rich, has found its way into the hands of the poor." As a food, therefore, for all races and classes, savage or savant, the banana already commands a leading position, but has not yet reached its zenith, and not the least of the many services that Mr. Fawcett has conferred on the West Indies will be the widespread publicity that Sir James Crichton-Browne's report will enjoy since it has appeared in the pages of his book, which is bound to have an exceptionally good circulation.

We say this because such a work has long been wanted, and wanted badly, only there was no one to write it; now that it has appeared it has done so at a very opportune moment, for the prospects of further developments in the industry are rosy, and, once a use can be found for the "smalls" and rejected

bunches, supplies would have to increase enormously to overtake possible demands as fresh uses and channels of trade are opened out. We hope, therefore, that those wise enough to buy the book under review will pay special attention to the contents of pp. 107-154 on by-products, especially the extraction of fibre and the distillation of alcohol from the stem and fruit of the *Musa* family generally. Taking the fibre first, this, we believe, although small in the percentage, say $1\frac{1}{2}$ per cent. (p. 152), works out in the aggregate to a substantial amount well worthy of attention, say about 15,000 to 18,000 tons of fibre per million stems. As, therefore, Jamaica alone exports some 16,000,000 bunches, and produces at least 25 per cent. more stems than that, we should imagine that this island was capable of turning out annually ($20 \times 15,000$ or $20 \times 18,000$ tons) 300,000 to 360,000 tons of fibre worth from £9 to £15 ton, according to the market, every ounce of which makes excellent paper. This, made on the spot, should be able to compete against European and American makes, and would certainly go a long way to help satisfy the paper hunger the world is suffering from and striving to appease at the cost of her forests. Such an industry, if feasible, surely offers a chance of leaving a further three to six millions sterling in the pockets or stockings of the producers year by year, less the cost of running four central establishments for the pulping of the cellulose from the fibre and the subsequent manufacture of the paper, leaving the fibre to be roughly extracted on the estates to avoid excessive transport.

This extraction of fibre leaves about 90 to 95 per cent. residue, mainly liquid, and we should imagine that, the same as with sisal refuse, alcohol for fuel could be made from it, one, too, that could successfully compete with potato, maize, or rice spirit, since it is only a by-product, and in fact a nuisance and danger which must or should be removed, whilst the others have to be specially grown to supply the necessary basis. Mr. Fawcett, therefore, wisely discusses the making of alcohol in detail, although he has confined his remarks mainly to the 25 per cent. of bunches on the total exports that are left behind or rejected for various reasons, but which can be turned into a beautiful liqueur, a pleasant wine, or a useful alcohol for fuel in quantities that, with a properly organized co-operation, could be immense.

In view of the possible developments of these side lines, in calling attention to Mr. Fawcett's masterly work on "The Banana: its Cultivation, Distribution, and Commercial Uses," we ask to be excused in having given up more space than we should have done to discussing them, but have had to wait for such an opportunity, as we could not have done so now without the publication of the book to help us.

As regards the details of banana cultivation, these, needless to say, have had the author's most careful attention, and as we know of no one more able and experienced to discuss them with us, we feel that those who turn to the book for the information they seek, will not be disappointed, whether it be a trivial matter or the most important items, as the preparation of the soil, suckers, planting, irrigation, drainage, mulching, pruning, harvesting, transport, each in turn are dealt with and discussed, and so are the questions

of pests, manures, &c. We are glad to see that the author is in favour of clean cultivation, and the removal of old stems to discourage the weevil borer and other pests that cause heavy losses (p. 100). Those making fibre and alcohol from the stems can consider the harm thus averted on the profit side in their balance sheets.

ALL ABOUT COCO-NUTS. By Roland Belfort and A. J. Hoyer, with frontispiece and 25 full-page illustrations. 201 pp., including index. Price 6s. net or 6s. 4d. post free. London: The St. Catherine Press, 34, Norfolk Street, Strand, W.C.

Attractively got up, beautifully printed, with perfect plates, and with a paper slip over the cover of a coco-nut tree, and a bisected husked nut in colour, this book at first glance resembles a 6s. novel rather than a work dealing with one of the most important of the economic products that come to us from the Tropics, and, at the moment, the one that is attracting the most attention. It has evidently been produced to attract the eye of the public, and if such a book does not do so, nothing will. The preface, we notice, acknowledges references to and quotations taken from *TROPICAL LIFE* and our own book on coco-nuts, and those who worked with us to produce the latter will quickly realize, as they glance through the new book now being reviewed that, if "Coco-nuts, the Consols of the East," had not been written last year "All about Coco-nuts" would have had a very different kernel to that which is now laid before the public. Built up, therefore, on the best foundations we are glad to see such a book appear on this side, as we feel that it will awaken considerable interest in the minds of the man in the street, and cause him to realize how dependent both he and his relations are on coco-nuts and their by-products, how necessary it is to increase their output, and what a splendid income can be obtained by those owning a coco-nut grove.

Recent reports showing actual results cause us to feel that the estimates as to reliable and continuous yields, as given on p. 16, are over sanguine. After allowing for droughts, sickly trees, 10 per cent. to 15 per cent. loss by pests, &c., we do not believe the average annual yield of estates of 2,000 acres and more will amount to 40 nuts per tree, and no returns yet published have shown any large estate to yield even that amount; and we certainly do not believe in West Africa as a coco-nut producing centre so implicitly as the authors of this book seem to (pp. 35-38). If the West Indies need 7,000 nuts to the ton of copra (p. 129), then West Africa needs a still larger number, for the Trinidad (W.I.) nuts at least sold recently up to \$40 per 1,000, for selected husked nuts, and are, on the average, much finer than the West African ever have been, although, of course, care and cultivation can improve the West African coco-nut as they have done with cacao. As the questions of manuring, cultivation, and pest extermination are fully discussed for such a book, we feel that those who do go to the West Coast to plant will realize that much has to be done to obtain the best results, and will thus be induced to set about and do it.

Meanwhile those of us who are so busy writing about coco-nuts will have to think of some new titles, otherwise, with the amount of literature now being issued on the subject, even the authors are troubled at times to know which author or what book is meant.

Tobacco Planting.

PART II.

HAVING discussed matters generally we can now settle down to work by taking note of the soil required for the various kinds. In India, according to the *Indian Planters' Gazette*, February 15th, 1913, p. 283, a light soil or sandy loam well drained, containing an average amount of organic matter and rich in mineral matter, is considered to be best suited for tobacco cultivation. Tobacco grown on clay soils is too coarse and inferior in quality for cigars. New alluvial soils are most suitable for the crop, and the plant being a greedy feeder can, as a rule, be grown with success, where other crops, on account of the over-richness of the new ground, would not be over grand. In last month's issue we referred to the influence the soil has on the leaves of the plants growing on it. This is what Mr. J. N. Harper* says on the subject, "No plant is so affected by different types of soil as is the tobacco plant. The variety of the tobacco grown in a given locality depends upon the type of soil in that locality. The texture of the soil seems to influence the character and quality of the tobacco more than its chemical composition does. Under given climatic conditions the class and type of the tobacco depend upon the character of the soil upon which it is grown, especially on the physical properties, while the grade is dependent largely upon the cultivation and curing of the crop. If the texture of the soil is known, it is possible to say what type of tobacco is best suited for it. Before the tobacco is set out, the soil should be thoroughly prepared by deep ploughing, rolling, and harrowing, and the rows should be laid off at a uniform distance with a marker. If sod-land is to be planted in tobacco it should be ploughed early in the spring to give the sod time to thoroughly rot."

Tobacco, it must be remembered, is a rank, rapid-growing, and heavy-feeding plant, and requires liberal supplies of plant food. On this account the careful experiments of Dr. Goessman, of the Massachusetts (U.S.A.) Experiment Station, and of Professor Stockbridge, of the Florida Experiment Station, furnish information of great practical value to the planter.

As a result of these investigations, the quantities of phosphoric acid, nitrogen, and potash per acre, suggested by these two authorities, are as follows:—

	Phosphoric acid		Nitrogen		Potash
Dr. Goessman ...	60 lb.	...	100 lb.	...	300 lb.
Prof. Stockbridge	73 lb.	..	180 lb.	...	300 lb.
Average per acre ...	67 lb.	...	140 lb.	...	300 lb.

A mixture of 600 lb. of high-grade sulphate of potash (96 per cent.), 850 lb. of nitrate of soda† and 550 lb. of super-phosphate (12 per cent.), or Thomas's Phosphate Powder would just about furnish the amounts

of phosphoric acid, nitrogen, and potash mentioned above.

The plant food found by chemical analysis in the tobacco plant, furnishes a fair guide in determining the kind and amount of fertilizer to use. Of course, not only the leaf, but the whole plant must be accounted for in figuring out the actual plant food taken up. While the leaf is the object of tobacco-growing, the leaf cannot be grown without the stalk, roots, &c. The analyses of the whole plant made by Professor Stockbridge indicate the following plant food requirements, based on what he found the average Florida tobacco plant to contain:—

Phosphoric acid		Nitrogen		Potash
0.99 per cent.	...	2.58 per cent.	...	4.34 per cent.

This indicates that the crop requires its plant food in the proportion of 260 lb. of nitrogen and 440 lb. of potash for every 100 lb. of phosphoric acid actually taken up by the plant. As phosphoric acid is apt to change into insoluble forms in the soil, allowance must be made for such losses in making up special fertilizers. Again, many soils accumulate supplies of nitrogen through the growth of legumes in rotation, and a too free supply of nitrogen in the fertilizer may prove very undesirable by inducing a too rank growth of leaf. For these reasons, many experienced tobacco growers use a higher proportion of phosphoric acid and a lower proportion of nitrogen than the chemical composition of the crop would seem to require.

Professor Stockbridge's recommendation for applying fertilizers is based on these conditions, and his formula supplies the necessary plant foods (as shown by the analyses) which will be removed from an acre of land by a fair crop of tobacco.

The conclusions of accepted authorities may be thus stated: The demands of the crop for phosphoric acid are small, for nitrogen they are large, but the greatest demand is for potash, in fact, greater than that of any other cultivated plant.

On the other hand, some friends write asking "whether the recommendations of Professors Goessmann and Stockbridge are based upon manurial experiments in which they tested different quantities of the three principal fertilizing ingredients (nitrogen, phosphoric acid, and potash), or whether their investigations were restricted to the analysis of tobacco crops. If the latter is the case, we consider the recommendations not in accordance with our present knowledge of plant nutrition. The power of the plants of assimilating nitrogen, potash, and phosphoric acid varies considerably. Provided the fertilizing ingredients are not supplied in excessive quantities, the plants can utilize 75 per cent. of the nitrogen applied, and 50 per cent. of the potash, whereas the assimilation of phosphoric acid does not exceed 25 per cent. of the quantity applied. Even if we do not take into consideration that most soils are more deficient in phosphoric acid than in nitrogen and potash, the full requirements of a plant in the proportion of 0.99 per cent. phosphoric acid, 2.58 per cent. nitrogen, 4.34 per cent. potash can only be met with by the application of the fertilizing ingredients in the following proportions:—

$$\frac{9.9}{25} = 4 \text{ per cent. phosphoric acid,}$$

$$\frac{2.58}{75} = 3.5 \text{ per cent. nitrogen,}$$

$$\frac{4.34}{50} = 8.68 \text{ per cent. potash.}$$

* See Part I, December issue, p. 233.

† In times past planters were prejudiced against nitrate of soda, saying that its use made the cigars smoke hot. Modern machinery and improved extracting apparatus at the nitrate works have removed any cause of such a complaint; planters, therefore, have only to see that they purchase their supplies from reputable firms, and when they have their fertilizers, whether nitrate of soda or anything else, to see that they use them and not abuse them by giving over-supplies or too much at a time.

COMPOSITION OF FERTILIZER MATERIALS USED AS SOURCES OF PHOSPHORIC ACID.

	Nitrogen, per cent.	Equivalent in Ammonia, per cent.	Potash (K ₂ O) per cent.	PHOSPHORIC ACID		
				Total per cent.	Available per cent.	Insoluble per cent.
South Carolina phosphate rock ... ..	...	...	...	26 to 27	...	26 to 27
South Carolina acid phosphate ... ..	...	...	...	13 ,, 16	12 to 15	1 ,, 3
Florida land rock ... ..	...	...	...	33 ,, 35	...	33 ,, 35
Florida pebble phosphate ... ..	...	...	...	26 ,, 32	...	26 ,, 32
Florida acid phosphate ... ..	...	...	...	14 ,, 19	13 ,, 16	1 ,, 3
Tennessee phosphate... ..	...	...	...	34 ,, 39	...	34 ,, 39
Tennessee acid phosphate ... ..	...	...	...	14 ,, 19	13 ,, 16	1 ,, 3
Thomas's phosphate powder... ..	...	...	...	17 ,, 19	14 ,, 16	...
Bone-black (spent) ... ..	...	...	...	32 ,, 35	...	32 ,, 35
Bone-black (dissolved) ... ..	...	...	...	17 ,, 19	16 ,, 17	1 ,, 2
Bone meal	2½ to 4½	3 to 5½	...	20 ,, 25	5 ,, 8	15 ,, 17
Bone (dissolved)	2 ,, 3	2½ ,, 3½	...	15 ,, 17	13 ,, 15	2 ,, 3
Peruvian guano	6 ,, 10	7½ ,, 12	1½ to 4	10 ,, 15	... 8	2 ,, 7

COMPOSITION OF FERTILIZER MATERIALS USED AS SOURCES OF POTASH.

	Pure potash (K ₂ O) per cent.	Lime per cent.	Nitrogen, per cent.	Ammonia, per cent.	Phosphoric acid, total per cent.	Chlorine, per cent.
Muriate of potash	50	...	...	...	...	45 to 48
Sulphate of potash (high grade)	50 to 55	...	...	...	...	0.3 ,, 1.5
Sulphate of potash magnesia	27 ,, 30	0.85	...	...	...	1.5 ,, 2.5
Carbonate of potash magnesia	18½	...	...	...	...	...
Kainit	12½	1.12	...	...	...	30 ,, 32
Manure salt	20	...	...	...	...	40 ,, 45
Cotton-seed hull ashes	20 to 30	10	...	...	7 to 8	...
Nitrate of potash or saltpetre	43 ,, 45	...	13 to 14	16 to 17	...	...
Wood ashes (unleached)	2 ,, 8	30 to 55	...	...	1 ,, 2	...
Wood ashes (leached)	1 ,, 2	35 ,, 40	...	...	1 ,, 1½	...
Tobacco stems... ..	5 ,, 8	3.5	2 ,, 3	2½ ,, 3½	...	...

"Tropical Life" Trophies for the Coming Rubber and Tropical Products Exhibition.

WHY SO FEW COMPETITORS FROM THIS SIDE?

CONSIDERING that London and elsewhere is being overrun just now with coco-nut propositions, good, bad, and very indifferent, to be floated, we are surprised and disappointed that legitimate concerns who are really producing nuts, and have copra to sell in reality as well as on paper, have not shown signs more freely than has been the case up to now, of competing in friendly rivalry at the coming exhibition to show whose copra is best, and what the best looks like. It is certainly a pity that in face of the money that has been spent, and is still going out to educate the public up to what copra, coco-nut oil, coir-fibre and other products of the *Cocus nucifera* palm are like, they should not be willing and even anxious to seize the chance of their lifetime (for even if one coco-nut boom is pulled off, those who benefit by it are not likely to enjoy the profits of a second one) of gaining far more publicity than all their circulars and private notices will give them, by coming out into the open and showing in the "meat" if not in the flesh, what they talk so much about on paper and at their meetings. Mere company-promoting "boosters" out only to fleece the public, and not really to plant coco-nuts,

will not, of course, want to show their faces in June at the Agricultural Hall, but there are one or two really good syndicates who are said to be planting up substantial areas and mean to stay, that ought surely to be only too glad to come forward, if only to show that they are legitimate concerns, and not mere get-all-you-can promoters. We hear a great deal of talk also about coir fibre, and yet there has not been a great rush of entries for this, certainly not as great as we expected, although Mr. Laidler, the coir fibre-cleaning expert, tells us that excellent fibre can now be turned out by machinery anywhere, compared to that cleaned by hand in Malabar and Ceylon.

We hope, therefore, that our coco-nut friends, as well as those planting Cearâ rubber, sisal and robusta coffee, will remember that Mr. Staines Manders is anxious to welcome their exhibits in June, and to help them advertise and push their sales, thereby increasing the price of their produce; but if they wish to take advantage of this help they must "buck up" and send in their entries without loss of time. To those showing the best samples of these various products, TROPICAL LIFE, as stated on advertisement p. xxxvii, will have much pleasure in presenting a gold medal, to which Mr. Manders adds a certificate, thus enabling the winners to carry away a pleasing, and at the same time extremely useful souvenir (for trade purposes) of the Exhibition, as well as of the excellent produce they showed.

TEA NOTES.

WHY NOT AN IMPERIAL EXHIBIT FOR THE (1914)
TROPICAL EXHIBITION?

WITH the output of tea increasing on all sides, and the advent, as chronicled in these columns from time to time, of new centres starting out to produce, would it not be a good thing to have a "bulked" or "blended" exhibit of Imperial grown teas at Mr. Manders' Exhibition in June, the lesser known centres as Natal, Jamaica, the West Coast of Africa, &c., being given a larger share of prominence than their output would warrant to encourage them to further action? The greatest optimist cannot pretend that any centre within the Empire can possibly interfere with Ceylon and India, whilst, on the other hand, if tea is to be grown at centres other than the East, for local consumption if not for export, why not encourage planting within the Empire and sell seed to our own planters instead of outside, as, quoting the *Indian Planters' Gazette*, we pointed out in our April and July issues, was being done to a considerable extent? We do not want to prevent Java from obtaining 'all the tea seed she wants, but do believe in encouraging tea planting throughout the Empire if any centre or centres care to make a serious trial.

Again, as regards India and Ceylon, such an exhibition coupled, be it remembered, with the important Congress on tropical economic products that will be held at the same time, affords an exceptional opportunity, if the various Planters' Associations care to consider it worth their while to do so, to discuss the possibilities of making oil from the seed of *C. thea*, either for consumption or for manufacturing purposes; whilst elsewhere, with the oil famine or oil hunger that besets us on all sides, other centres could inspect the samples of seeds and oil, ascertain yields and cost of cultivation, and discuss the planting of other varieties of the *Camellia* family, especially the *C. sasangua*, as an oil-producing plant only, as is done in China and Japan.

Meanwhile, a striking trade exhibit of tea, under the care of M. Duchesne, at any rate as representing India, with cupfuls galore dispensed around to visitors, together with neat and attractive printed matter, would, we feel sure, be as good an advertisement as the most exacting member of the Association would desire, and must surely increase sales, which is what we all want. At times we believe such proposals are tabooed because they tend to interfere with the catering contract, but further expansion in the consumption of Indian and Ceylon tea is of far more importance than a catering contract, so that arrangements would have to be made to overcome that trouble.

The New Year, report Messrs. W. J. and H. Thompson, has opened with a strong and active market; the feeling of the room has been buoyant, and while tea generally has sold readily, an eager demand has been in evidence up to 8½d. per lb.; quotations are about steady to firmer on the closing rates of last year, and a hardening tendency has been noticeable in the region of 8½d. per lb.

Imports during December were heavy, and the increase of seven and three-quarter millions was prac-

tically confined to Indian tea; duty payments, however, were good, and although exports were less, the total outgoings for the month, with one extra working day, were one and a quarter million lb. better. Heavy arrivals have added six and three-quarter million lb. to the stock, which is now identical with last year. The increase is confined to Indian teas, all other growths being in deficiency.

The crop from Northern India is apparently coming forward quickly; the total increase harvested is generally estimated to be between six and seven millions in excess of last year, but up to recently about ten million lb. more had passed through Calcutta and Chittagong, seven million lb. of which have been shipped to the United Kingdom, and nearly three million lb. to outside markets. It is therefore obvious that receipts will be on a lighter scale than last year during March, April, and May next.

EXPORTS OF INDIAN TEA FROM APRIL 1ST, 1913, TO
DECEMBER 17TH, 1913.

	Season 1913-14. lb.	Season 1912-13. lb.	Season 1911-12. lb.
United Kingdom, including Shipments via Chittagong	173,206,372	168,802,725	164,355,313
Australasia	8,276,703	7,655,162	7,347,635
Canada	5,440,499	5,021,475	4,160,014
United States	1,678,845	1,808,119	2,237,938
Hong Kong... ..	429,476	401,154	467,142
Hankow	8,447,030	6,901,004	3,164,932
Russia	25,337,338	22,889,409	17,617,087
Hamburg and Bremen ...	538,645	514,128	525,593
Other Continental Ports ...	181,577	267,223	283,856
Constantinople	173,709	203,340	322,785
Trebizonde	259,222	616,158	428,629
Batoum	4,193,666	5,323,062	4,536,029
Bombay	3,364,177	3,699,363	2,782,726
Persian Gulf	1,045,867	2,119,816	1,712,765
All other places	3,407,141	3,706,817	3,066,073
Total	235,980,267	229,928,955	213,008,517

After an interval of three weeks the market reopened with little or no change to report, and the tone was very similar to that ruling previous to the holidays. Good competition was extended to all qualities of Indian teas, and the level of value remained practically the same as that ruling at the closing sales of last year. Common tea was fully firm, and there was hardly anything obtainable under 7¾d. per lb. The average price realized for the whole sale (during week ending January 10th) on Garden Account was 9d. per lb. compared with 8d. per lb. last year, and for Ceylon it was 9d. per lb., against 8¾d. per lb. a year ago.

The advance in prices, according to Messrs. McMeekin and Co., taking the whole year as compared with the previous one, amounts for Indian tea to fully ¾d. per lb., while for Java and China tea it is probably rather more. This increase in first costs for a trade where retail prices are inelastic is a serious matter. The distributive firms that make tea a leading line have therefore had to submit to a reduced scale of profits. The syndicate shop companies, who run other goods with tea, appear to have suffered severely by the increased cost of materials for margarine, the sale of which in recent years has become one of the most important lines with businesses of the

kind. While the distributors have suffered, the producers have gained, and there has been a quite material appreciation in both capital and dividend with the majority of tea-growing companies. The index is Mr. Geo. Seton's valuation of the shares of 170 tea-producing companies as follows:—

December 1st, 1909	...	...	...	£22,900,000
" 1910	...	...	...	30,300,000
" 1911	...	...	...	33,800,000
" 1912	...	...	...	32,100,000
" 1913	...	...	...	32,250,000

But for the serious depreciation because of rubber interests, in the case of some prominent Ceylon companies included in the 170 list, the figures would have been considerably higher.

The very great prosperity of the tea-growing industry in recent years is evidenced by these figures, and the result presents a marked contrast to the depth of depression in 1902, when on September 1st a similar valuation gave a total of only £12,100,000. The re-export trade done through London has continued to increase, and its extent for 1913 should prove a record. The trade done direct by foreign countries with the chief places of production has not fallen off, so it is obvious that the world in general is consuming more tea. The prospects for the future are good, as a fall in the rate of tea consumption is most unusual anywhere.

There has been more rain than usual in December in Northern India, which will benefit cultivation and new clearances, but the fall in temperature has been too marked to prolong the season. Snow is reported from Darjeeling district. It has been said that snow before Christmas has not been known for twenty years; the season there has, however, long since closed, so it can have no effect on crop results.

The Annual Report of the Agricultural Department of Assam, just out, is most interesting and instructive reading, and shows valuable results attending the experiments in soil improvement, planting, and crop rotation with reference to sugar-cane, as, whereas the prevalent idea has been that cane can only be grown profitably once in seven years, the experiments have proved that with land treated properly and put under a suitable rotation it can be grown two years out of four. Experiments with potatoes, fodder crops, and fruit have also been usefully undertaken.

The Director (Mr. McSwiney) deserves credit for his endeavour to frame a broad policy of industrial development based on the needs of the greater crops of Assam, and so soon as the experimental farm in the Surma Valley is started, the question of improving the rice crop will be undertaken energetically, as there can be no question that the improvements by economical manuring and selection of seed would be one of the greatest boons to the population at large, especially now that rice is so much dearer.

ACCORDING to the *Indian Planters' Gazette*, Mr. Bainbridge Fletcher has been appointed Imperial Entomologist at Pusa in succession to Dr. Lefroy, retired, and Mr. Ballard from Nyasaland has been appointed to take Mr. Fletcher's place as Entomologist to the Madras Government.

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART II.

The Spraying Machines of Messrs. Wm. Weeks and Son, Ltd.

IN the first of this series of articles published last month we dwelt generally with the question of disease, and included an illustration of the rhino beetle in the various stages of its career to show one of many pests which, at times, beset the planter in the Tropics be he ever so careful, and which are certain to pay him a visit and bring others in their turn should there be any slackness about as regards the watch kept for pests, and the precautions taken to keep them at a distance. As we have said in this journal and elsewhere* this trouble, unfortunately, need not be due to carelessness on the part of all those attacked, but it can start on one ill-kept estate and spread to a hundred carefully preserved ones, so that whether the owner keeps his lands free of pests or not, he must still have an ample supply of power, hand and knapsack spraying machines to atone for the misdeeds of others who persist in doing wrong even if he does not.

For these reasons we have induced Mr. Staines Manders to promise that, if the makers of spraying machines support him at the coming (June) Rubber and Tropical Exhibition by showing their machines to the planters and experts who will be filling the Agricultural Hall, he will do his best, both at the Congress and in the Hall itself, to give the utmost prominence possible to the question of pest prevention and extermination.

Meanwhile, as we stated last month, the leading firms are supporting us in our campaign, and among these our old friends and supporters, Messrs. Wm. Weeks and Son, Ltd., of Perseverance Works, Maidstone, are especially prominent. The rapidly increasing and, in fact (as throughout South India and elsewhere), the urgent demand for the right class of spraying machine has caused planters to look round and see which makers have had the greatest experience in their manufacture and have given the greatest satisfaction to judges, agricultural experts, and the planters who buy the machines. On these points Messrs. Weeks can show that their apparatuses have secured all three of these recommendations, as shown by the number of first prizes they have secured, the testimonials received, and, perhaps most important of all, their increased connection and the repeat orders they receive from old customers.

Most of our readers know these machines well, or, at least, some of them; but for those who do not know all their leading makes, especially for use on estates, we will call attention to the following, beginning with their pneumatic hand-sprayer, which they make in three sizes, namely, 3½, 5 and 7 pints capacity. It is absolutely clean in working and can be used for spraying or watering plants in dwelling-rooms without fear of damage to furniture. The necessary pressure is obtained by working the pump for half a minute or so after the container has been filled with spraying solution. Then we come to the "Weeks'" Knapsack

* As in "Some Notes on Soil and Plant Sanitation," TROPICAL LIFE Publishing Department. 11s. post free.

Sprayer, which is constructed entirely of gun-metal and brass, and has no parts to become corroded by the use of chemical washes. All the working parts are easily accessible, and the pump is powerful, so that a good pressure can be obtained at the nozzle. The capacity is $3\frac{1}{2}$ gallons. Besides these our friends have specially designed a sprayer to meet the demand they have received for a strong, effective and simple sprayer suited for limewashing, or work where something larger than a knapsack is required. It is made of 6 or 8 gallons capacity and is provided with a 10 ft. length of hose, 2 ft. 6 in. brass branch, and multi-spray nozzle. Coming to rather larger appliances their small hand-spraying machine of the barrow type is specially suited for gardens and small plantations where the space between the rows is small. It is made of 12 or 20 gallons capacity, and is provided with a pump suitable for supplying one or two nozzles; whilst their hand-spraying machine, which gained first prize at the Royal Agricultural Society's trials, is of larger capacity, and having two travelling wheels mounted near the centre of the tank, is more easily moved about as the weight is taken off the handles. The pump is very powerful, and a strainer bottle is fitted to the suction to prevent solid matter being drawn in, and the valves can be taken out and cleansed by removing the screw cap situated over each. The air vessel is of large capacity, so that a very even pressure is maintained between each stroke of the pump. The machines are supplied with either wood or galvanized tanks, two 20 ft. lengths of hose, bamboo and brass branches and nozzles.

In large plantations, where the work cannot be accomplished quickly enough by hand machines, power sprayers are used which, with a system of mains and hose, will supply twelve or sixteen nozzles. With these the work is more effectively done as a higher pressure can be maintained. For this reason we show on advt. p. xxviii an oil power spraying set, viz., a five brake horse-power portable engine, with a set of three-throw gun-metal plunger pumps, and a tank for the washing mixture mounted on a separate carriage. At

the same time a very efficient agitator is fitted in the tank, which is connected direct with the chain drive, so that it is working all the time the engine is running whether the pumps are working or not. An adjustable relief valve is fitted, and can be set so as to keep the spray at any desired pressure, the overflow being carried back into the tank. The whole plant is very compact and is capable of pumping over a long distance.

Planters Abroad and Politicians at Home.

THE *Indian Planters' Gazette* of December 13th starts with an excellent article on "The Planter: a National Asset," which makes one hope, or rather, let us say, wish that it were possible to let us hear a little more of *this* asset at election times on this side, especially in proportion to what we are overwhelmed with, at times, in the shape of the British workman, his muscles and miseries, even if, after the results of the poll are known, the planter, like the British workman, is apt to be forgotten by the successful candidate. *Mais ça n'importe pas*—the publicity given is an advantage, because, as the British workman knows, candidates' speeches at such times get very fully reported in the local press, which enables tit-bits to be extracted and preserved for resurrection at awkward times, awkward for the M.P., but pleasant for the disappointed resurrection man. By the way, now and again we have heard caustic remarks, not always undeserved, about the stupidity of certain M.P.s in connection with labour and land discus-

sions in the Tropics, and there is no doubt that each side would benefit considerably both now and in the future were India, Ceylon, Malaya, and other tropical centres to invite a party of M.P.s to visit their shores and see the commercial and agricultural industries in the working, as was done in our self-governing Colonies, to which trip Mr. Will Crooks referred in his remarks at the Mansion House (see p. 13), and our subsequent conversation left no doubt in our minds that a visit to the Tropics is also highly desirable for all concerned.



From Circular 4—*Trinidad Mycologist's Report*, 1911.]

Where a Spraying Machine was needed.

Coco-nut Palm in Trinidad (W.I.) affected both with Root Disease and Bud-rot.

The Growth of Lever Brothers, Ltd.

THE following particulars were given by the above firm in the prospectus they issued towards the end of October, when inviting the public to invest another £500,000 in their company:—

At the time of incorporation in 1894 the present Company became the owner of the works, plant, and village at Port Sunlight, comprising in all an area of 86 acres. Extensions and additions to the works, plant, and village at Port Sunlight have been continuously made throughout the intervening nineteen years, until to-day the works and village comprise an area of 440 acres. The buildings within the works area of 217 acres have a floorage space of 2,407,982 square feet, and include soap and glycerine factories, oil and cake mills, alkali, printing and other works, wharves, docks, roads and sidings, together with the head offices of the Company. The buildings within the village area of 223 acres include 811 houses and cottages, eight shops, recreation halls, library, museum, hospital, with parks, gardens, and over 5 miles of roads. The tenure of all is freehold.

In addition to its estate at Port Sunlight the Company owns valuable properties in London and Dublin of leasehold tenure, and in Manchester and Newcastle-on-Tyne of freehold tenure, and has acquired interests in other soap and glycerine businesses in the United Kingdom.

Abroad, the Company has largely developed its business by the formation of Associated Companies, building and equipping factories for the manufacture of soap and glycerine in France, Belgium, Germany, Switzerland, the United States of America, Japan, Australia, Canada, and South Africa, and has controlling interests in these Companies and in other similar businesses. In connection with the supply of materials used in their manufacture, the Company or its Associated Companies own oil mills in West Africa, Australia, South Africa, and Japan, coco-nut plantations on islands in the Pacific, and concessions in West Africa, including a convention with the Belgian Colonial Government whereby that Government has granted to the Société Anonyme des Huileries du Congo Belge rights to cultivate and collect palm fruit and manufactured oil in five regions of the Belgian Congo where palm forests exist. The whole of the shares in the Société Anonyme des Huileries du Congo Belge other than qualification shares of nominal amount have been allotted to trustees on behalf of the Company and its Associated Companies, and have been partly paid up.

Thus in the United Kingdom and abroad the Company, in addition to its business at Port Sunlight, holds interests in over sixty Associated Companies,

with numerous branches or selling agents throughout the world. The works and plant are in efficient working order and repair, and full provision has been made for depreciation.

The present issue is made to provide further capital in connection with the Company's business generally, and for the extension of the businesses and undertakings of its Associated Companies, including development work on plantations in the Pacific Islands and general development at various stations on the West Coast of Africa and in the Belgian Congo.

During the current year of 1913 the profits of the Company have increased as shown by the figures at the foot of the page. These were extracted from the Company's balance sheets and certificated by its auditors, Messrs. Cooper Brothers and Co.

A Report and its Denial.

ON the last day of 1913 Reuter wired across from Shanghai that a gigantic British combine was announced as having been formed in that city for the manufacture of soap and allied products in China, the firms concerned being Messrs. Lever Bros., Brunner, Mond and Co., Crosfield, Gossage, and the Erasmic Company. Some progress in the matter seemed apparent, since land was stated to have been acquired at Shanghai, according to the cable, where a factory equipped with the latest scientific appliances was to be established. The nominal capital of the companies was put at £35,000,000, and the combine, it was believed, created a British record. Soon after, however, Mr. Roscoe Brunner, managing director of Brunner, Mond and Company, gave an emphatic denial to the reported formation of such a combine, and in answer to a note that we addressed to Messrs. Lever Bros. on the subject, we were told that no doubt we had noticed that the report had been contradicted.

The saying goes that there is no smoke without fire; here we certainly have plenty of smoke, so one cannot help wondering how much fire is or was behind it, and whether it has been totally quenched or is only smouldering.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

PRESSURE of space in this issue forces us, with regret, to hold over our notes on the American Customs and the Plumage Bill there, and the question of propagating a race of mules that might breed in the Tropics.

	Paid-up capital		Freehold works and plant		Interests in associated companies and investments		Reserve fund		Depreciation account		Dividends to shareholders		Rate of ordinary dividend
	£		£		£		£		£		£		
1907 ..	4,765,000	...	2,018,968	...	1,581,373	...	356,004	...	248,239	...	286,531	...	8 per cent.
1908 ...	5,100,000	...	2,071,639	...	2,041,803	...	365,012	...	293,054	...	340,571	...	10 "
1909 ...	5,100,000	...	2,190,224	...	2,828,306	...	376,616	...	341,234	...	396,250	...	12½ "
1910 ...	6,220,458	...	2,440,126	...	3,554,157	...	435,366	...	392,978	...	462,805	...	15 "
1911 ...	7,592,500	...	2,613,556	...	4,725,797	...	500,072	...	447,510	...	553,522	...	15 "
1912 ...	8,600,000	...	2,798,554	...	5,562,140	...	512,537	...	514,204	...	603,479	...	15 "



"Tropical Life" Friend.—No. 103.

SIR PIETER C. VAN B. STEWART-BAM.

The Originator of the idea of holding the South African Exhibition, 1907, and of the British Dominions Exhibition for 1915.

EVERYBODY who troubles about the British Empire and its interests—and who does not?—is probably aware that, as long ago as 1910, it was arranged at a meeting held at the Royal Colonial Institute (which can truly be described as the mainspring of the Empire, if the neighbourhood of the Bank, Royal Exchange and Mansion House is the hub) to hold a British Imperial Exhibition. This was there and then inaugurated and became known as the British Dominions Exhibition, of which we give further details on p. 12, as regards the progress of the movement which can now be said to have come to a head with the decision to hold it at the Crystal Palace.

What is not so generally known is that the idea of holding such an important Exhibition originated with "Our Friend" this month, who has very properly and wisely been elected Chairman of the Executive Committee. Prompted by the great success of the South African Exhibition held at the Horticultural Hall, London, in 1907, Sir Pieter was induced, like Cecil Rhodes, to dream dreams of a larger and altogether more embracing celebration of the expansion and development of Great Britain and her self-governing Dominions and Colonies, especially as regards the production and utilization of raw materials. Approaching Lord Strathcona, "Our Friend" received every assistance possible, financially and otherwise, and in such matters, important as finance may be, the "otherwise," by begetting enthusiasm and energy, goes a long way to make such an Exhibition a real success. When the public pronounce the 1915 British Dominions Exhibition to have been a great success, especially as having helped to consolidate the four States in South Africa, the five in Australia and the various provinces of Canada, not only upon each other, but with the Empire as a whole, then it will be realized what this assistance means.

As "Our Friend" stated at the Mansion House meeting, raw material that cannot be produced or articles which cannot be made within the British

Empire are not worth troubling about. Other countries may, here and there, in individual cases as regards Art and Music, excel us, but as regards Crafts we still hold our own, and the Exhibition to be held in 1915 is to show the progress we have made, and to demonstrate where further improvements can be introduced. At the same time a sample depot of John Bull and Co.'s goods for the world's market will be brought together, whereby an enormous impetus to trade must result, especially as it is hoped that (since, thanks to the generosity of the Earl of Plymouth and others, the Crystal Palace now belongs to the Nation) the exhibits of the Overseas Dominions can remain there for some time, and so still serve the same purpose as a sample collection to stimulate our trade overseas.

So much for the Exhibition. Coming now to its originator, "Our Friend" is a good specimen of the modern energetic, go-ahead Dutch South African who has inherited the push and enterprise of the English with the cautious plodding of his Dutch forbears. His Imperial training includes Cheltenham College and then the South African College; leaving here he entered the Cape Garrison Artillery, and supported us throughout the South African War, retiring at the close with the rank of captain, and then gave vent to his energies by entering the Cape Colony Parliament—a supporter of Sir Starr Jameson—as a member for Cape Town, to which constituency he was, in 1908, returned as senior member, a position he continued to hold until the union of all the South African Colonies was brought about. Migrating to this side "Our Friend," it may be recalled, married in 1910 Miss Ena Tasca Stewart, of Ards, Donegal, an Irish lady, and has remained on this side since, during which time he has been working on the scheme of this Imperial Exhibition.

In 1907, whilst still a member of the Cape Parliament, he originated, organized, and brought to a most successful issue the Exhibition of South African Products held at the Royal Horticultural Hall. The Exhibition was visited by all the leading men and women in London—in Society, Politics, Finance, and Commerce—whilst Their Majesties King Edward and Queen Alexandra, as well as the present King and Queen, also made a careful and discriminating inspection of the various exhibits, which were so numerous as to be somewhat crowded.

A very pleasurable incident connected with this visit was the knighting of "Our Friend" by His Majesty before leaving the Hall, proving thereby how greatly he appreciated all that Sir Pieter had done for South Africa and the Empire at a very critical period when it was most important to bring all parties together to work in friendly unison. We believe that this has given "Our Friend" the distinction of being the only Colonial who was personally knighted by King Edward.

As souvenirs of the occasion, a stick made of a single piece of rhinoceros horn was presented to King Edward, and a fan of choice ostrich plumes, the ivory handle studded with diamonds, emblematic of the Colonies from whence the stones, ivory and plumes came, was graciously accepted by Queen Alexandra.

Such, therefore, has been Sir Pieter Stewart-Bam's career in the past. A comparatively young man, he has still much to do; and those who know the man, listen to his speeches, and watch him at work, feel that he can and will do it.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JANUARY, 1914.

The (One and Only) Cure for Eastern Rubber.

SMOKE-DRY IT À LA AMAZONA.

THE report of the Standardization Committee of the Rubber Growers' Association, of which we give particulars at the close of these notes, drives home forcibly and clearly to its readers that the East, if it means to successfully compete with the West, must turn out its rubber "to type" (we prefer this useful old term, since we know that market men the world through know and understand it) and not "to fancy."

"A question that is agitating and influencing the market," the *Indian Planters' Gazette* of December 6th tells us, "is whether plantation rubber is, on its merits, a serious rival to wild rubber. It has been asserted that it is not as lasting, and therefore the manufactures subjected to hard wear are better made of the wild product. . . . One method of raising the price of rubber is to put on the market a more standardized article. Purchasers are always apt to unduly lower prices when there is uncertainty in the grade of the article they are purchasing, and there is a complaint in the market that, owing to greater variations in the method of manufacturing plantation than wild rubber, there is more reliance to be placed on the latter. . . . Standardizing would therefore tend to similarity of treatment and a restoration of confidence to purchasers." Every page in the report presented by the Committee to the Rubber Growers' Association had already confirmed by anticipation the above opinion. "We consider," says the report, "that the evidence which has been put before us clearly proves that variability of a substantial character exists (and) . . . prevents manufacturers from

using our product to the extent they would if some guarantee of quality could be given to counteract this variability."

"Agreed—'nuf said—shift"—we heard a hustling but laconic Yankee once say, and the emphasis on the last word caused the black imp's stay to be as brief as her master's speech. Surely in face of the above unanimity it is fully time to stop talking and "shift" the hundred and one methods of preparing Eastern plantation rubber "to fancy," and substitute a single method for turning it out "to type." Had the Committee been instructed to ascertain which methods should be tried to bring this about, and perhaps to further ascertain if one method could not supersede all others, or whether two or three can do it equally well, then we feel their time would have been better employed, and those interested in plantation rubber—and "we," unfortunately, are among those who are—would have learnt something that they did not know before the report was issued.

Whatever may be said for or against "fine hard," no one can deny that it sells, sells easily, and sells well compared to Eastern plantation; also that, once the latex is collected, the cost of curing and preparing it for transport is practically nothing in comparison to Eastern kinds. All this, too, is in spite of the Brazilian rubber-gatherer's utter disregard of every one of the many trivial details* that the ten learned men from the East thought it necessary to give their fellow-members who control, it has been estimated, nearly £100,000,000 of British money invested in the plantation rubber industry, and who are, therefore, we should have imagined, too well versed in estate management to need being taught their A B C.†

After having carefully studied the report, we would suggest that the same Committee be now instructed to remedy this variability in Eastern rubbers, not by spending anything up to £29,000 a year (see p. 12) to prove that it exists, but by ascertaining by which method it can be avoided. We know there is a method (possibly more than one‡) and the process we refer to is already being worked on a practical commercial scale, for

* Such as collecting cups and latex receptacles must be easy to clean. Bark shavings must not remain in the cups. To ensure cleanliness the latex should be received in the verandah. Its reception must be under European supervision, &c. Do the *seringueiros* along the Amazon, whose rough-and-readily prepared product is selling according to Dr. Schidrowitz at 50 per cent. to 100 per cent. above the finest Eastern grade, do all that is here recommended, and, if not, why worry about them in the East? "On the present basis of price of rubber," Dr. Schidrowitz told the Committee (see answer to Question 36, on p. 36 of the report), "taking spot 'fine hard' at 3s. 7d. and average first latex at 2s. 2d., and allowing for a factory loss of 20 per cent. in the case of the Brazilian article, and if we assume that price is equivalent to quality, then average first latex, on the basis of a standard index figure of 100 for 'fine hard' washed and dry, is only about 50." In plain English we read this as meaning that "fine hard" finally costs the manufacturers exactly twice as much as average first latex, in spite of its originally rough-and-ready preparation. Dr. Schidrowitz was by far the principal witness, for out of 137 questions put, he received and answered fifty.

† Our readers should study Hardenburg's "Putumayo," or Woodroffe's account of the "atrocities" he claims to have witnessed, and then they can realize the full force of our remarks, for even those in charge, who commit the atrocities, are hardly capable of carrying out the cleanly methods of the East.

‡ This could easily be done by an International Committee, not of planters or sellers, but of the manufacturers or buyers who are, after all, the ones to recommend by which method the rubber had best be cured.

regular consignments treated by the process are sold in considerable quantities in every auction, and the rubber certainly appears to meet the every requirements of the manufacturer (who, after all, is the final arbiter) as to quality and uniformity—in other words “Standardization.” But until there is unanimity among even the members of the Rubber Growers’ Association and they are agreed which process to adopt all the reports possible cannot remedy the variability of Eastern plantation rubber, the existence of which is the one point alone on which all agree.

THE Committee referred to above was appointed, it will be remembered, by those present at an extraordinary general meeting of the R.G.A. (Rubber Growers’ Association), held on July 21st (or a few days before we wrote our leading article on Standardization, published last month),* to consider a scheme for a more accurate system of standardizing and evolving plantation rubber and for extending its use. The members included ten leading men in the plantation rubber world, and whilst we are sure that no better men could have been chosen, we would like to have seen Mr. T. C. Owen’s name added, as his remarks at the meeting on October 23rd, according to the report in the *Financial Times*, provoked discussion which is always of use on committees, as it prevents them being too much of a one man or one clique show. “Coming to the question of standardization,” Mr. Owen told those present, “one of the disadvantages from which plantation rubber is at present suffering, was that the manufacturer was more certain of getting exactly what he required when he bought fine Pará than he was when he bought plantation.”

This diversity is, of course, due in a considerable degree to the different ages of the trees tapped; but, provided a uniform method of preparing and curing Eastern rubber for market was adopted, the rubber could be divided, as Brazilian is, into two grades (from mature and immature trees), which, together with uniformity in cure, would carry it through to many a factory, at whose door it now remains knocking in vain. Uniformity of cure begets uniformity of sale, whether Brazilian rubber, São Paulo coffee, San Thomé cacao, F.M. or F.M.S. copra, or any other product turned out on a huge scale of a recognized and reliable quality, and so increases the demand and value.

Instead of urging such a uniformity, the report proposes that an elaborate system of classifying the various grades of Eastern rubber should be adopted (thereby surely further aggravating the evil, by this publicity, instead of remedying it) on the basis of the index figure of quality, and to rent or establish a central testing station and factory that may cost, according to its capacity, from £18,300 to deal with 10,000 tons per annum, up to £29,000 for 30,000 tons, or from 20s. to 40s. per ton of rubber, thereby already adding to its cost which the estates are trying so hard to reduce. To this we can only say, as we do to the details *re*

* Commenting on the method we proposed, or rather suggested, for adoption, both the *Financial Times* in London as well as a leading Scotch paper, after quoting the details in full, said that the description, “bizarre as it may appear to the typically unimaginative rubber grower, undoubtedly has something in it.”

ensuring cleanliness on the estates, the Brazilian rubber sells well and easily without all this, because it is uniform. Make the Eastern rubber uniform and reliable, and then the makers who buy, and not the planters who sell, will need no certificate or other inducement to buy it at a fair price, but will do so with as great or greater willingness even than is now the case with Brazilian *pelles*.

There is one other item which we believe mitigates against or discourages the sale of Eastern rubber on a parity with Brazil, and that is the present terms and conditions of sales. We cannot say exactly on what terms Brazilian rubber can be purchased, but we have always understood that they are easier, and offer greater facilities for financing than the fourteen days’ prompt of the London Public Sales. If those, therefore, who complain of the terms are justified in doing so, why not sell rubber on the same prompt as tea or spice, viz., three months, less 5 per cent. interest if taken up before the prompt day? This allows the purchaser time to find his money, and the planter must remember that rubber needs a good deal of money to be found. Once increased facilities are given as suggested, then far more firms could go into the business, and their competition would force up prices, which is what the planter wants, but what the big dealers are most anxious to avoid.

The British Dominions Exhibition (1915).

TO BE HELD AT THE CRYSTAL PALACE.

REFERRING to the paragraph in our October issue regarding the above exhibition, it had not at that time been decided where the exhibition would be held, but arrangements have now been made with the owners of the Crystal Palace to hold it in the buildings and grounds of that well-known pleasure resort on lines similar to, but much more elaborate and representative than, the “Festival of Empire,” held there in 1911.

“An exhibition unique in the annals of the Empire will be held at the Crystal Palace in 1915,” reported the London *Daily Telegraph* last month. “It will illustrate the natural products and manufacturing resources of the British people throughout the world, and will, it is hoped, focus attention on the future of trade and commerce between the Dominions and the Mother Country. The British Dominions Exhibition will provide the inhabitants of the United Kingdom with an ocular demonstration of the unlimited capabilities of the Empire, and will materially assist in knitting more closely together the various nations which own allegiance to the British flag.

“What may be described as the official sanction of London was given to the project at a meeting at the Mansion House recently, when the Lord Mayor presided over a large and enthusiastic assemblage of members of the Grand Council concerned in arranging for such an exhibition to be held. Acting under his doctor’s orders, Lord Strathcona, President of the Exhibition, was absent, but amongst those present were: Lord Redesdale, Lord William Cecil, Sir Pieter Stewart-Bam (chairman of the Grand Council, from whose active brain the scheme emanated, see

p. 10), Sir R. Cooper, M.P. (vice-chairman), Lord Southwark (president of the London Chamber of Commerce), the Earl of Hardwicke, Lord Blyth, Sir John Taverner (late Agent-General for Victoria), Mr. Hamar Greenwood, M.P., the Hon. T. Mackenzie (High Commissioner for New Zealand), Sir J. McCall (Agent-General for Tasmania), Mr. C. du P. Chiappini (Trade Commissioner for South Africa), H. Hamel Smith (the Editor of TROPICAL LIFE), who sat next to 'Imperial Bill,' (otherwise Mr. Will Crooks, M.P.), Sir A. Birch, Admiral the Hon. Sir E. R. Fremantle, the Hon. A. A. Kirkpatrick (Agent-General for South Australia), Sir E. Clarke, Rear-Admiral Sir R. K. Arbuthnot, Sir L. Spencer, General Sir A. Montgomery Moore, Surgeon-General J. Cleghorn, Mr. Faithfull Begg (chairman, London Chamber of Commerce), Mr. T. P. O'Connor, M.P., Sir J. Forsey, the Hon. J. H. Turner (Agent-General for British Columbia), the Hon. P. McBride (Agent-General for Victoria), the Hon. P. Pelletier (Agent-General for Quebec), Sir J. Sandys, the Hon. T. A. Coghlan (Agent-General for New South Wales), Mr. R. Reid (Agent-General for Ontario), Colonel John Howard (Agent-General for Nova Scotia), Mr. C. Cobb (chairman of the London County Council), Mr. H. Morrison, M.P., Mr. I. Rappaport, Mr. D. V. Pirrie, M.P., Mr. A. W. Black, M.P., Mr. E. Jones, M.P., Dr. Chapple, M.P., Mr. Neville D. Cohen, Mr. C. J. Stewart (hon. treasurer), Mr. A. C. Beck, M.P., and Mr. P. J. Hannon (hon. secretaries), and Mr. H. N. Bolton (secretary).

"Letters expressing regret at inability to be present were received from, amongst others: The Duke of Argyll, the Duke of Westminster, Mr. Bonar Law, M.P., the Marquis of Crewe, the Marquis of Lansdowne, the Earl of Aberdeen, Mr. L. Harcourt, M.P., the Earl of Derby, Lord Charles Beresford, M.P., the Duke of Portland, the Lord Chief Justice, Lord Emmott, the Hon. Harry Lawson, M.P., Lord Strachie, the Earl of Plymouth, the Earl of Darnley, and Cardinal Bourne."

Sir Pieter Stewart-Bam, in expressing regret at Lord Strathcona's absence, said his lordship had been the guiding spirit from the beginning, and not only had he given the Committee his advice, but also financial aid. Sir Pieter then read Lord Strathcona's speech, in which his lordship pointed out why the year 1915 would prove a memorable one in the history of the Empire, and finally moved the following resolution:—

"That this meeting at the Mansion House, under the Presidency of the Right Hon. the Lord Mayor of London, cordially endorses the proposal for the organization of an exhibition representative of all parts of the British Empire at the Crystal Palace in 1915, and pledges itself to give the project its whole-hearted support."

This was seconded by Lord Redesdale, G.C.V.O., in an interesting speech and supported by Ireland in the person of "Tay-Pay" (Mr. T. P. O'Connor, M.P.), the London Chamber of Commerce by Lord Southwark (President of the Chamber), New Zealand by its High Commissioner (Hon. T. Mackenzie), Sir Ian McCall (Tasmania), Mr. du P. Chiappini (South Africa), and Mr. Will Crooks, whose speech was as witty as it was useful and went a long way to clinch the arguments in favour of holding the exhibition. The resolution, needless to say, was carried unani-

mously, the meeting concluding with a vote of thanks to the Lord Mayor for presiding and for extending the hospitality of the Mansion House to the Grand Council, moved by Mr. Cecil Beck, M.P., and seconded by Sir John Taverner.

Mr. Will Crooks, again quoting the *Daily Telegraph*, which headed his speech in large capitals "Mr. Crooks's Imperialism," told those present that the "exhibition was to be one of the British Dominions, and it was really the marvellous outcome of the wonderful tour made by King George and Queen Mary when Prince and Princess of Wales. At the Guildhall, on his return, His Majesty said, 'Wherever we went the people's hearts swelled with conscious pride at their co-partnership in this great Empire.' That was a marvellous and prophetic utterance, but, not by many a year yet, had the people of the Empire been made to understand how great, large, and important it was.

"The extraordinary thing about the Empire was that its pioneers usually came from very poor stock indeed, although it was good stock. It was the native wit and the capacity to bear trouble under all circumstances that had made this great Empire of ours respected all the world over. Whilst he was on the Empire tour, at Mount Barker, in Western Australia, he met a man who said, 'You must know me, my name is Pickles.' Mr. Crooks replied, 'I was weaned on them. What can I do?' The man showed him a piece of land he had taken from the Government fifteen years ago. The man had worked on the railway for many years, and, with his wife and children, had lived under canvas. He had cleared that ground, and last year he took £900 for fruit, of which £450 was clear profit to himself, his wife, and two sons.

"The Dominions Exhibition was going to be a peaceful mission, a mission of understanding, of getting into touch with one another, and of making those in the Dominions see and understand that somebody at home cared about them."

WITH the greatest regret we have to report the death of Mr. H. Melville Wills, M.A., B.Sc. (Agr.), the genial and capable representative in London of the Potash Syndicate. Mr. Wills's loss will, we are sure, be regretted by business and personal friends alike. Through the medium of this Journal we have had the pleasure of forming many new friendships, and that of Mr. Wills was one that we valued greatly, and find it hard to forgo.

Grenier's Rubber Annual came to hand just after New Year's Day, and maintains the improvement shown year by year by its predecessors. The illustrations include one of a coco-nut tree carrying over 400 nuts, as well as of a coffee robusta bush bearing profusely, both on the Vilanang Estate, F.M.S. Articles of the usual high standard are contributed by Messrs. Edward Salmon, Arthur Shephard, G. S. Montague, W. A. Tinnock, J. F. Ashby, and A. E. C. Detrez. The 64 pages contain some 80 illustrations. Price 3s., to be obtained in London of F. E. Rist and Co., Vulcan House, Ludgate Hill, E.C.

Annual Review of India-rubber Market for 1913.

By Messrs. S. FIGGIS AND Co.

PLANTATION rubber grown in Ceylon, British Malaya (Federated States, Perak, Malacca, Johore Straits), Sumatra, Java, India, Borneo, &c.:—

Exported	1913.	1912.	1911.	1910.	1909.	1908.	1907.
From Ceylon (& India)	11,590	6,300	2,750	1,430	600	350	230
„ Malaya, &c. ...	35,410	22,200	11,400	6,800	3,250	1,450	780
Total (tons) ...	47,000	28,500	14,150	8,230	3,850	1,800	1,010

As shown by the following figures, the supply from Brazil has been wonderfully maintained, notwithstanding the lower price, the total shipments from Brazil being, we estimate:—

1913.	1912.	1911.	1910.	1909.
39,000 ...	40,500 ...	39,500 ...	40,500 ...	42,000 tons

including Amazonas, Bolivia, Peru, Mollendo, Manicoba, &c.

As stated in our previous annual review, the demand for Plantation rubber was excellent throughout last year, and practically the whole of the largely increased supply has gone to consumers, but prices are barely half those of last January. Considering the very disturbing failures in America and the severity of the money market, the last six months especially, the trade has shown wonderful strength in buying such an increased quantity, and this in view of further rapid increases in Plantation output this year. Frequent and larger selling “forward” would have benefited producers, and we continue to urge this to be more generally done when manufacturers and others are buyers to cover their wants. 23,500 tons have been sold in the auctions held here every fortnight with active competition.* Also the great care and improvement in preparation by most planters has been a strong inducement to consumers of Plantation. The demand for tyres for motors and cycles has further increased.† We congratulate the managers on the general splendid output and quality. Ceylon shows again a large increase. South India, Travancore, and Mergui also of very nice quality. We estimate about 1,000,000 acres under rubber cultivation in the East—part will, no doubt, revert to jungle—but of the

* Many of our Eastern contemporaries have been filling their columns with articles arising over such queries as “Why send rubber to London for sale?” A very full answer to this question was published in TROPICAL LIFE for January, 1913, in the same issue, that is, in which Messrs. S. Figgis and Co.’s previous annual report appeared. We consider we show there very plainly the reason why it pays to send at least a portion of the Plantation rubber output, as well as cacao, sugar, &c., to London for sale, and that reason is because it pays the producers to do so, as they will find out to their cost the day that they give up London public sales altogether.—ED., T.L.

† Attention has been called, report Messrs. Zorn and Leigh-Hunt, to the enormous development of the motor industry by the announcement that the Ford Motor Company intends distributing during the present year £2,000,000 sterling amongst its employees, under a new profit-sharing scheme. Last year the Company’s output reached the record number of 186,000 cars; and from the way in which the demand goes on increasing, it would seem that the automobile age is still within the period of infancy.

probable 120,000,000 trees only a proportion have been tapped. Many estates wisely continue to employ mycologists to study diseases and watch remedial measures. We hear of fewer complaints of “Fomes.” We urge that all rubber be packed loose and dry; flat in lengths of the cases, and not doubled over or twisted. Rubber should not arrive mouldy and damp, as such will not pass as “fair average” quality.

As regards its preparation, the proportion of “smoked” rubber has greatly increased, and it is liked, if well done and uniform colour and not over-smoked and sooty. Fine smoked sheet should be ribbed and even, like “Highlands,” which continues to realize high prices. Rubber should be washed as clean as possible, and very small lots of different descriptions are not liked and realize lower prices. Lots of under 4 cwt. are sold as “star lots” at the end of the auctions. The cases should be strong; 1 to 2 cwt. seem regular sizes, but perhaps double that size may be found suitable as quantities increase. No paper or fuller’s earth should be used. Cotton adhering to rubber from the presses is very much objected to and depreciates value. The cases should be planed smooth inside to avoid small pieces of wood adhering to the rubber.*

We understand some new process will be tried to produce rubber in the form of Fine that comes from Brazil. The samples we have seen appear good, and we hear the process of preparation is very rapid, but only results of imports can establish the suitability of new descriptions. “Byrne” cured sells very well.

We are inclined to repeat our suggestions to “standardize” qualities into No. 1 Standard Latex pale, No. 2 clean light brown and grey, No. 3 (from bark) dark and brown. There has been a continued and universal extension of motor vehicles, and the world’s increased supply of rubber, probably 105,000 tons, has been absorbed. Stocks are now small.

Imports of rubber from Jelutong declined; shipments of raw Jelutong were about 10,000 tons. Rambong has been in small supply and sold well. Castilloa also, but was mostly too soft. Guayule, partly owing to the revolution in Mexico, has fallen to 2,000 tons. The manufacture of “reclaimed” rubber has been very great, and as “reclaiming” is now so general, this must be considered an important factor.

Last January good sheet sold at 4s. 7½d. To-day’s price 2s. 2d., smoked 4s. 8½d.; to-day’s value 2s. 4d. Pale Crêpe at 4s. 7½d.; to-day’s value 2s. 3d. The frequent fluctuations are shown here.

We estimate that the following areas are under plantation rubber:—

Rubber Plantations	1913.	1912.	1911.	1910.	1909.
	Acres	Acres	Acres	Acres	Acres
Ceylon ...	220,000	220,000	210,000	200,000	187,000
Malaya, Malacca ...	500,000	430,000	350,000	290,000	240,000
Borneo ...	20,000	20,000	20,000	12,000	10,000
Dutch E.I., 150,000	400,000	230,000	200,000	185,000	120,000
Java, 230,000					
Sumatra, &c.,					
India and Burma ...	45,000	40,000	40,000	30,000	31,000
German Colonies, Samoa, 2,000,	60,000	42,000	45,000	45,000	38,000
E. & W. Africa					

* It is for this reason that Venesta cases are recommended.—ED., T.L.

Mexico, Nicaragua, and Honduras have planted some *Castilloa*; also Colombia, Ecuador, Bolivia, and Peru. Parts of the planted young rubber will not be continued.

India is extending. More in Burma and Mergui. The Philippines (small as yet), Samoa, Hawaii, other islands and New Guinea, Queensland small, and Seychelles little. The East and West Coast of Africa have plantations; some also in Congo region and German West Africa, also in British East Africa, Uganda, and the West Indies (probably 5,000 acres).

As regards rubber from Brazil, Amazonas, Bolivian, Peruvian, and (wild) medium rubber, the consumption continues to increase with the supplies, and 1913 has been an active year for manufacturers. The tyre trade especially is much bigger, as the demand for motor vehicles and cycles develops so greatly. Probably of raw rubbers, 105,000 tons were used, besides great quantities of reclaimed, but less of mediums, which have not been so abundant. Europe has had a good and increasing trade, England and Russia particularly, and America has increased fairly, but the strike last spring caused a pause there for some months. 800 tons of old rubber are still held by the Syndicate in Brazil. Most of the old stock held has been sold, and the continued full supply from Brazil has been used.

As detailed previously, the supply of Eastern Plantation increases very rapidly, and is sold at once in our fortnightly auctions, which Brazil must take account of.

Medium rubber has been difficult of sale even at moderate prices, and very low prices were accepted for considerable lots in the autumn. Supplies of Caucho Ball increased; this rubber has continued in favour. This year's crop was good quality. All fine *should be cut and carefully selected before shipment*. Caucho Ball increased and relatively high. Bolivia increased. Mollendo small. Venezuela *via* Orinoco small. Ceará and Maniçoba smaller. Pernambuco and Assare very little. Mattogrosso crop fair, but some lots not very desirable quality. Mangabeira, from Mattogrosso, Santos, &c., fair supply, and sold much cheaper. Mexico decreased. Guayule, owing to revolutions and low prices, decreased to 2,000 tons (not one-third of last year). Colombia very small. Ecuador and Nicaragua scarcely any. East Coast Africa: Zanzibar, &c., small; good quality sold well. Nyasaland very little. Liberian more. Mombasa and Lamu: Good parcels of Manihot Crêpe and pressed strips met a fair demand at lower prices. Uganda small. Abyssinian: Very little came—prices low. Madagascar: Decreased (probably not 200 tons), odd small lots were difficult to sell. Rangoon small. Assam but little, good cheaper. Penang in less supply and sold readily at fair prices. Sumatra plantations send increased quantities of nice rubber. Java and Borneo small, but we may expect increased supplies of Plantation from there. Tonkin and French Cochin China very small supply. New Guinea sent us none. Jelutong much less and cheaper. Malaysian, extracted from Jelutong, good Crêpe, clean, sells fairly.

Balata in steady supply, and closing lower; Sheet 2s. 9d., and block 1s. 11½d. Gutta-percha, good qualities realized high prices.

Monthly fluctuations of Pará, 1913.				Value of E. I. Standard.			
Hard Fine.				Latex Crêpe.			
January	...	Opened ...	Lowest ...	Opened ...	Lowest ...	Opened ...	Lowest ...
		4s. 6¾d.	4s. 3½d.	4s. 7d.	4s. 3d.	4s. 7d.	4s. 3d.
February	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		4s. 3d.	4s.	4s. 3d.	4s.	4s. 3d.	4s.
March	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 11½d.	3s. 8d.	4s.	3s. 9½d.	4s.	3s. 9½d.
April	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 8d.	3s. 3d.	3s. 8d.	3s. 1½d.	3s. 8d.	3s. 1½d.
May	...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...
		3s. 5d.	3s. 10½d.	3s. 1½d.	3s. 6½d.	3s. 5d.	3s. 10½d.
June	...	Lowest ...	Highest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 8½d.	3s. 10d.	3s. 2½d.	2s. 11d.	3s. 8½d.	3s. 10d.
July	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 10d.	3s. 7½d.	2s. 10½d.	2s. 8½d.	3s. 10d.	3s. 7½d.
August	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 11d.	3s. 8½d.	2s. 10d.	2s. 7d.	3s. 11d.	3s. 8½d.
September	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 9½d.	3s. 7d.	2s. 8d.	2s.	3s. 9½d.	3s. 7d.
October	...	Highest ...	Lowest ...	Highest ...	Lowest ...	Highest ...	Lowest ...
		3s. 5d.	3s. 1d.	2s. 2½d.	2s. 0½d.	3s. 5d.	3s. 1d.
November	...	Highest ...	Lowest ...	Lowest ...	Highest ...	Lowest ...	Highest ...
		3s. 4d.	3s. 0½d.	2s. 1½d.	2s. 6d.	3s. 4d.	3s. 0½d.
December	...	Highest ...	Closing ...	Highest ...	Closing ...	Highest ...	Closing ...
		3s. 2½d.	3s. 1½d.	2s. 4d.	2s. 2½d.	3s. 2½d.	3s. 1½d.

(New terms).

The sale of January 2nd (1914) was the first to be subject to the New Rule, under which there is no allowance made for Draft or Discount; consequently buyers have lowered their prices about ¾d. per lb. to allow for this. Taking this into consideration, the opening prices were fully steady against the close of the previous sales; dark grades of Crêpe showing an improvement of ½d. per lb. As the sales progressed Standard Crêpe rose about ¼d., and brown grades fully ½d. all round. On the second day all grades of Crêpe improved a further ¾d., closing ¼d. below the best, and Smoked Sheet remained about steady throughout the sales at the opening price. The bidding throughout was brisker than usual, and the sales were finished on the second day. Highlands fetched the top price for Smoked Sheet, selling at 2s. 7¾d. to 2s. 8¼d.; Crêpe cured by the "Byrne Process" again fetched a premium, realizing from 2s. 3d. to 2s. 3¾d. for the first grade. Lanadron Block was sold at 2s. 2¾d. and 2s. 3d. per lb.

Pará rubber statistics for the month of December:—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará	...	3,150	440 = 3,590 agst.	4,920	3,830	2,640
Shipments to Europe	1,480	280 = 1,760	„	2,210	1,640	1,770
„ „ America	1,660	160 = 1,820	„	2,210	2,670	1,340

Crop statistics, June 30th, 1913, to December 31st, 1913 (six months):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.	1909.
Pará { 1913 ..	13,850	2,630	16,480	19,060	16,010	15,780	16,710
Receipts { 1912 ..	16,390	2,670	16,390	19,060	16,010	15,780	16,710
„ Shipts. Europe	6,900	1,630	8,530	10,190	8,490	8,660	7,590
„ „ America	6,690	1,140	7,830	10,310	9,460	6,850	8,840

THE announcement has just been made, by the *Mindanao Herald*, of the marriage of Dr. J. W. Strong and Miss Isabel Garcia, which took place at Isabella de Basilan on November 2nd. Dr. Strong is well known throughout the islands as the pioneer rubber planter in the Philippines. He is manager of the Basilan Plantation Company, and has succeeded in making that plantation one of the most valuable agricultural properties.

Cotton.

THE following were the prices for Cotton in London on January 8th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1913.		Compare	Good, 1914.		
	d.	d.	d.	d.	d.	d.	d.	d.	d.		d.	d.	per lb.
Surat kinds *	5 $\frac{5}{8}$	to 5 $\frac{1}{8}$	5 $\frac{7}{8}$	to 6 $\frac{5}{16}$	6 $\frac{1}{8}$	to 6 $\frac{5}{8}$	—	6 $\frac{3}{16}$	to 6 $\frac{3}{8}$		5	to 5 $\frac{3}{16}$	
Madras ...	6 $\frac{5}{16}$	to 6 $\frac{7}{16}$	5 $\frac{1}{8}$	to 6 $\frac{11}{16}$	—	—	—	5 $\frac{7}{8}$	to 6 $\frac{5}{8}$		4 $\frac{3}{4}$	to 5 $\frac{7}{16}$	—
Bengal ...	—	—	5 $\frac{3}{16}$	—	5 $\frac{7}{16}$	—	5 $\frac{9}{16}$	5 $\frac{5}{8}$	—		4 $\frac{9}{16}$	—	—
Assam ...	—	—	5 $\frac{9}{16}$	—	5 $\frac{1}{8}$	—	6 $\frac{1}{16}$	6 $\frac{1}{8}$	—		4 $\frac{7}{8}$	—	—
China ...	—	—	5 $\frac{5}{8}$	—	5 $\frac{1}{8}$	—	6 $\frac{1}{4}$	6 $\frac{1}{4}$	—		5 $\frac{1}{4}$	—	—
West Indian ...	6 $\frac{3}{4}$	—	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8	7 $\frac{3}{4}$	—		7	—	—
Sea Island ...	12	—	14 $\frac{1}{2}$	—	18	—	21	15	—		13	—	—
West African ...	6 $\frac{1}{2}$	—	6 $\frac{1}{8}$	—	7 $\frac{3}{16}$	—	—	6 $\frac{7}{8}$	—		5 $\frac{3}{8}$	—	—
East ..	6 $\frac{7}{8}$	—	7 $\frac{3}{4}$	—	9 $\frac{1}{2}$	—	—	7 $\frac{7}{8}$	—		6 $\frac{7}{16}$	—	—

* Liverpool quotations.

Since our last issue (of December 18th) prices of "Futures" show a decline of 19½ to 22 points for present, and 15 to 12½ for new crop deliveries. The daily takings from spot by the Trade upon resumption of business after the holidays have been fairly heavy, but dealings in "Futures" are within very narrow limits. The Ginners' Report, due now, is awaited with great interest. East Indian is ⅜d. to ¼d. lower, and very little business passing. The Bank rate is reduced to-day to 4½ per cent. Silver is quoted at 26½d. per oz.

The import into Liverpool this week (ending January 10) amounts to 193,295 bales, since September 1st 2,253,117, same week last year 121,539, last year's total 2,740,275 bales. The estimated Sales amount to 58,000 bales, including "called." Middling American is quoted at 6·92d. per lb., last year 7·04d., 1912 5·33d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight ...	9,949,000	9,835,000	9,949,000	bales
Exports from United States since September 1st—				
To Great Britain ...	2,000,000	2,475,000	2,420,000	—
To Continent, &c. ...	3,391,000	3,264,000	3,118,000	—
Total crop ...	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	January 8th.	Same time 1913.	Same time 1912.	
	d.	d.	d.	
January ...	6·60	6·78½	5·15½	per lb.
Jan.—Feb. ...	6·60	6·75	5·15½	—
Feb.—Mar. ...	6·61½	6·73½	5·18	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

PUBLIC sales were resumed on 6th inst. There was a generally good demand, and for the better grades fully steady rates were obtained, fine new crop Costa Rica particularly realizing good prices; lower qualities were rather in buyers' favour. The stocks in the principal ports of Europe on January 1st, according to Messrs. Düring and Zoon, show an increase for the month of 572,000 bags, against an increase of 378,000 bags a year ago; the visible supplies on the same date show an increase of 524,000 bags, against an increase of 576,000 bags last year. Shortly after the date of our last report the market for "futures" became flat on heavy receipts and lower offers from Brazil, and the value of March Santos declined to 43s. 6d. A firmer tone prevailed on the official announcement that no valorization sales would be held this year, and prices recovered, though the close still shows a decline of 10½d. since December 23rd. We quote :—

	To-day	Dec. 23rd, 1913
London ... Santos, Mar. del. ...	44s. 9d.	45s. 7½d.
New York ... No. 7, Rio ..	9.25 cents	9.40 cents
Hamburg ... Santos ..	50¼ pf.	52 pf.
Havre ... Santos ..	63 francs	63¼ francs

The receipts at Rio and Santos from July 1st, 1913, to January 7th, 1914, were 10,753,000 bags, against 9,195,000 bags and 9,902,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

Marangu.—At 74s. 6d. for middling, 79s. 6d. to 84s. for good middling to good bold.

Costa Rica.—New crop at 65s. to 69s. 6d. for smalls, 69s. to 85s. for fine ordinary to good middling, 80s. to 92s. 6d. for middling to fine bold coloury.

Guatemala.—At 70s. for low middling, 80s. for bold.

Mexican.—At 65s. 6d. to 70s. for palish and greyish.

Honduras.—At 54s. for good ordinary bold palish.

Colombian, &c.—At 55s. 6d. for smalls, 61s. to 75s. for good ordinary to middling, 72s. 6d. to 80s. for bold.

Dumont Santos.—Unwashed at 51s. for smalls, 54s. 6d. for medium.

From the lowest point of the year, report Messrs. Rouse and Co., there was a gradual recovery in prices on reduced estimates for the present Santos crop and most unfavourable reports as to the flowering prospects of the 1914-15 crop, and by the middle of October an advance of 14s. was registered. Since that period the markets have been very unsettled with continual sharp fluctuations, and on Brazil becoming a heavy seller and receipts larger than expected half the recovery has been lost, cash month being quoted 46s. During the year the sales of valorization coffee amounted to 1,231,000, leaving a balance of 3,200,000 bags. The following figures of recent Brazil crops and present estimates may be interesting:—

			Rio.	Santos.			Total.	
Crop	...	1909-10	...	3,449,000	...	11,495,000	...	14,944,000
		1910-11	...	2,438,000	...	8,114,000	...	10,552,000
		1911-12	...	2,484,000	...	9,972,000	...	12,456,000
		1912-13	...	2,900,000	...	8,585,000	...	11,485,000
Estimates		1913-14	...	3,000,000	...	9,500,000	...	12,500,000

As regards the 1914-15 Brazil crop it is still too early to give reliable figures, but owing to the very unfavourable flowering of the Santos crop several estimates as low as 8,000,000 bags have been received from important firms. With such small estimates present prices seem moderate at about 15s. under 1912 rates for the same period.

Sugar.

WRITING on January 8th, Messrs. C. Czarnikow, Ltd., tell us that the New York market has somewhat recovered from the pressure of Porto Ricos, of which supplies, in the long run, would probably not suffice even for the present reduced meltings, and prices improved from 3.12 to 3.20 cents, whilst a few shipped Cubans had to be sold at 3.23 cents, but generally none are offering under 3.26 cents = 8s. 9d. c.i.f. United States, or 9s. United Kingdom for chartered lots, and 3d. more for fresh and later parcels. Our market thereupon, after receding from 9s. 5½d. to 9s. 4½d. for May beet, improved to 9s. 5¾d. on foreign trade demand, stimulated partly by unfounded rumours of rains in Cuba, but closed at 9s. 5d. The weather has been unfavourable abroad for transportation, snow and frost prevailing, but that only affects January speculation, as United Kingdom is so well provided with sugar that there is hardly any store room available in the outports. The total stock on January 1st reduced to raw stands at 263,500 against 159,500 tons, though the deliveries in December (178,500 against 166,500 tons) were satisfactory; this may not all mean consumption, because heavier deliveries to free stores always take place when arrivals are large and bonded stores crowded. The Cubans imported in December were, of course, of the old crop, but whereas last year we had none here in January/February, and only 9,550 tons in March, we are likely to receive at least 20,000 to 25,000 here in February, exclusive of future business, and more in March. But prices are not at a high level, and holders of beet seem indifferent about cane sugar competition at prices which are partly below the cost of production. The Cuban crop promises well, and is estimated at from 2,400,000 tons to over 2,500,000

tons. A few cargoes have been sold from 10s. 4½d. c.i.f. London, and as low as 9s. 1½d. c.i.f. for shipment in January or February.

Though values of grain and potatoes are low, as mentioned last week, an extension of sowings at reduced prices for roots is not talked of except in Russia, where the trade is protected, and 15 per cent. more may be sown. Holland, after reducing last year, may also grow a little more. France complains about difficulties regarding labour.

The American market opened with a firm tendency, and Porto Rico sugars sold at 3.15, then 3.20 cents, whilst shipped Cuban sugars were done at 1½ cents c. and f. = 3.23 cents = 8s. 8¼d. c.i.f. New York, but unshipped sugars are held ½d. to 3d. higher. The landings in the three ports for the week were 21,000 tons, and meltings 18,000 tons, increasing stocks to 82,000 tons.

Refining grades of cane sugar in the United Kingdom have been in better demand, and in some cases 3d. per cwt. advance has been paid. Grocery Crystallized has sold more freely, and a good business was done at about previous to slightly easier rates.

As regards cane-producing countries, the West India mail advises seasonable weather and good prospects in Trinidad. In British Guiana there was for about a fortnight almost continuous rain all over the Colony, followed by dry weather, which will do good to the cane cultivation. From the Cape we hear that the weather in Natal has been suitable for the young canes and for planting, but less favourable for the mature canes, a quantity of which will probably have to be held over till next season, cutting having been delayed too long owing to the strike.

The total transactions for the week of British West Indian amounted to about 18,000 bags, including Crystallized Demerara, good middling greyish yellow at 14s. 3d. duty paid; good middling yellow, 14s. 6d.; good yellow and pale, 15s. to 15s. 3d.; fine yellow and pale, 15s. 6d. to 16s. 9d. Syrups, low foxy brown, 9s. 9d.; low yellow to middling soft ditto, 11s. to 11s. 6d. Crystallized Trinidad, low and middling yellow, 13s. to 13s. 3d. Syrups, fine soft pale, 15s. Crystallized Barbados, low brownish, 13s.

At auction, 419 bags Crystallized Surinam sold, low to middling yellow and good middling palish ditto, 13s. 9d. to 14s. 4½d. duty paid; 110 bags brown Syrups sold at 11s. 6d. to 11s. 9d.; also 537 bags yellow Crystallized Peruvian sold at 12s. 6d. duty paid.

Up at Liverpool, about 1,770 tons grainy Peruvian changed hands at 9s. 6d. to 9s. 9d. floating, landing, Greenock and Liverpool, basis 96 per cent. polarization; and about 610 tons Syrups at 8s. 1½d. floating, landing, Greenock, and 8s. 4½d. quay Liverpool, basis 89 per cent. polarization.

ACCORDING to the *Cuba Review*, a substitute for cement can be made from slaked lime, linseed oil, and cotton fibre. The process is started by pouring the oil on a handful of cotton, after which the lime is dusted in. It is then kneaded until the whole is thoroughly mixed and about the consistency of dough. The more it is kneaded the better it becomes.

In Turkey, where ordinary cement is not used, a United States Consular report tells us, the above substitute is used with good results.

Coco-nut Products, &c.

ACCORDING to Messrs. Mordaunt Bros., the oil market on January 10th found that speculators had unsuccessfully tried to force up the price of linseed oil, but buyers would not respond, so that things were quiet. With coco-nut oil a small c.i.f. business had been done in Ceylon at 45s. 6d., but there are now free sellers at that price; against this Cochin is easier at 48s. on c.i.f. terms. Palm oil is quiet at the rates quoted below, whilst Palm kernel oil has had quite a good market for all sorts, Lagos having improved by 10s. to 15s. ton. At the request of several readers of the article on "Biao Nut, Tung or Wood Oil," which we published in our November issue, we are including Messrs. Mordaunt's report on this article as well. They tell us that the market is firmer at 30s. 3d. spot, or 29s. c.i.f.

Prices on January 10th were quoted as follows:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos	... 32s. 9d. to 33s.		31s. 6d.	29s. 6d.
Benin	... 29s. 6d. to 29s. 9d.		28s. 6d.	28s. 6d.
Congo	... 26s. 3d. to 26s. 6d.		26s. 6d.	27s.
Bleached	... 33s. 6d. to 34s. 6d.	32s. 9d. to 33s. 6d.		32s. 6d.
Clarified	... 30s. 6d. to 31s. 6d.	29s. to 30s.		29s. 6d.
<i>Palm kernel oil</i>	44s. 3d.	38s. 6d. to 39s. 6d.		37s. to 38s.
<i>Coco-nut oil:</i>				
Cochin	... 50s.	47s. to 48s.		45s. to 47s.
Ceylon	... 45s. to 48s.	41s. to 42s.		42s. to 44s.
English pressed	43s. 9d.	37s. 3d. to 37s. 6d.		36s.
<i>Copra oil:</i>				
Ceylon	... 42s. 3d. to 49s.	None		38s. to 40s.
Cochin	... 52s.	None		42s. to 44s.

According to the *Public Ledger*, values run as under:—

Soya Oil.—Hull: spot £27; March-June, £26 10s. Oriental (in cases), January-February, £26 5s.; February-March, £26 5s.; March-April, £26 10s.; April-May, £26 10s. c.i.f. Antwerp.

Coco-nut Oil quiet. Ceylon spot, £47 10s.; December-January, £45 5s. c.i.f.; January-February, £45 5s. c.i.f. Cochin spot, £57; January-February, £48 c.i.f.

China Wood Oil.—London spot, £30 5s.; January-February, £29; February-March, £29; March-April, £29 c.i.f.

Palm Oil.—Lagos on spot, £35.

Palm Kernel Oil.—January, £43; January-March, £43 5s. f.o.b. Hamburg.

Soya Oil Beans steady. Parcels spot, £8 10s., afloat £8 8s. 9d.; December-January, £8 8s. 9d.; January-February, £8 8s. 9d.; February-March, £8 8s. 9d. Hull.

Linseed Cakes.—London made, £7 10s. to £7 15s.

Cotton Cakes.—London made, £5 6s. 3d. to £5 7s. 6d.

Copra steadier. Malabar, December-January, £31 15s. buyers, and January-March, £31 10s. Hamburg. Ceylon, November-December and December-January, £31 5s. buyers Hamburg. Java, October-December, £30 2s. 6d. paid and buyers; December-January, £30 buyers, and January-March, £30 3s. 9d. to £30 2s. 6d. paid and sellers Holland, Hamburg, and Bremen. Macassar, November-December, £30; December-January, £29 15s. buyers, and January-March, £29 15s. Holland, Hamburg, and Bremen. Singapore, December-January, £30 paid, and Feb-

ruary-March, £30 2s. 6d. paid and sellers Hamburg. Cebu, November-December, £29 10s. paid and buyers, and December-January, £29 10s. buyers Marseilles. South Sea Island, November-December and December-January, £29 17s. 6d. sellers London. F.M. Straits, December, £29 15s. sellers, and January, £29 15s. paid and sellers Marseilles. Manila, December, £29 paid; December-January, £29 sellers, and January-March, £28 15s. buyers Marseilles. Mixed no Padang, October-December, £28 12s. 6d. buyers; December-January, £29 12s. 6d. buyers, and January-March, £28 13s. 9d. paid Marseilles, all c.f. and i., delivered weight. On the 17th the market had declined on further pressure to sell, Malabar, January-March, being quoted at £31 7s. 6d. and Ceylon, January-February, £30 15s.

Messrs. Goodlake and Nutter report that the oil market having declined somewhat rapidly, there has been more business done in Ceylon oil, and a little under 44s. 10½d. has been accepted for January-March shipment to London, and 45s. 10½d. for February-March shipment to New York; however, there now seems to be a little feeling, and we may see a small advance. Cochin is a nominal market, and we quote 48s. 9d. to 49s. Palm Kernel Oil: There has been a fair amount of business done in this article, and near positions especially have declined considerably, 42s. 9d. having been accepted, but 43s. is wanted now. Forward positions, however, are rather steadier, with buyers at 43s. and sellers at 43s. 6d., the sellers not being quite so eager to operate in the distant positions. Pressed Oil has not been offered very much except for forward. April-June sellers at 43s. 3d., and buyers of January-April at the price.

In their annual review on linseed and other oil-yielding seeds, the London Produce Brokers' Association report speaks as follows of coco-nut oil:—

Coco-nut Oil.—Ceylon: Prices during the year 1913 reached a higher level than has been known for many years, in fact, showing a record since regular statistics have been kept. Another feature to be commented on was the length of time during which the market remained at above £45 c.i.f. London. The year opened with oil at about £39 10s. per ton, rising gradually till by the end of August buyers were to be found at £47 10s. c.i.f. London. The subsequent tendency has been downwards, with a very limited trade passing, sellers at the close asking £45 10s. c.i.f. London for current shipment.

Total shipments from January 1st to December 8th, 1913, 24,249 tons; ditto, January 1st to December 2nd, 1912, 16,934 tons.

Cochin.—The position during 1913 calls for no particular comment. Fluctuations in price, though at times considerable and rapid, have not been frequent, and sellers have shown great patience when buyers have been absent. The highest point reached was £51 c.i.f. London, which was paid during the end of October, since when prices have gradually declined to £47 10s. c.i.f. London, this being the quotation for current shipment.

Total shipments from July 1st to October 31st, 1913, 4,071 tons; July 1st to October 31st, 1912, 4,182 tons; July 1st to October 31st, 1911, 6,255 tons; July 1st to October 31st, 1910, 6,131 tons.

The London Cocoa Market.

BY THE EDITOR.

THE New Year did not bring anything exciting in its wake, no one was cornered, and so had to pay 70s. for superior Bahias, or 75s. for good red Trinidads; prices, on the contrary, went easier, and pressure to sell rather than to buy, especially with Bahias, pulled values down to only 61s. 6d. for the finest superiors, whilst other kinds sold at the rates shown at the close of this report, and so mark a further drop.

Liverpool had apparently a very heavy December, receiving 109,854 and delivering 40,750 bags. Her latest news shows a somewhat firmer tone throughout, in rather marked contrast to the first week in January, when buyers showed little disposition to operate, even when a reduction in rates was offered. For the twelve months—January-December—Liverpool imported very nearly half a million bags, say, 497,166; of these she exported 301,100, and otherwise delivered 143,425 bags.

Compared to this London (in the twelve months) received 272,791 bags, and delivered for home consumption and export 266,000, against 359,093 that came into Havre, and 346,727 bags that went out.

According to Messrs. Martin, Weinstein and Co.'s figures, the stock of San Thomé at Lisbon was considerably increased last month, the movements at that centre for December being:—

Stock on December 31st	...	...	66,203	bags
Add landings during December	...	...	130,399	"
	Makes	...	196,602	"
Less deliveries during December	...	...	56,409	"
Leaves a stock on December 31st, 1913, of	...	...	140,193	"
Against "	"	"	1912, of	92,700 "
"	"	"	1911, of	166,159 "

Coming to stocks, these run as under:—

Havre Stock, December 31st—	1913. Bags.	Value. Pcs.	1912. Bags.	Value. Pcs.
Pará	7,559	82 to 86	13,577	83 to 85
Bahia	5,100	74 " 80	8,240	75 " 82
Venezuela	45,161	75 " 200	19,295	87 " 200
Trinidad	14,532	78 " 82	18,965	85 " 92
Grenada and O.W.I.	1,046	74 " 80	2,116	71 " 80
San Thomé	1,940	77 " 79	608	78 " 80
San Domingo	3,264	71 " 76	8,414	70 " 74
Haiti	2,831	66 " 76	8,651	63 " 76
Accra	35,222	69 " 74	24,990	70 " 73
Guayaquil	18,858	74 " 80	26,311	76 " 83
Others	12,582	—	4,662	—
Totals	148,095 bags		135,829 bags	

London Stock, January 10th	1914. Bags.	1912. Bags.	1912. Bags.
Trinidads	8,734	3,599	3,191
Grenadas	4,255	2,958	8,358
Other W.I.	3,358	4,825	5,943
British Africa	8,484	7,681	10,225
Portuguese Africa	5,759	5,664	2,697
German Africa	2,671	8,099	4,977
Ceylon and Java	10,372	11,159	9,535
Guayaquil	19,062	16,884	43,096
Bahia and Brazil	1,563	2,920	357
Other Foreign	9,505	7,657	8,611
Totals	73,763	71,416	96,990

As regards production, the *Gordian*, as usual, pub-

lish up-to-date figures as regards both production and consumption. By these they show that the Gold Coast exports for December were much less than most people expected. I was not altogether surprised, but those who think that the cocoa is not there will be unwise to speculate on such an idea, for they may find that they are wrong and that what did not come out in December will come in January or February, which two months in 1913 exported as much (16,000 tons) as November and December are estimated to have done. As a result of the year's work the Gold Coast is estimated to have shipped 48,000 tons, against 39,500 last year, and 40,600 tons (of 1,000 kilos) in 1911. The San Domingo exports for the past three years run very even, with about 20,000 tons each year. The Guayaquil output proved an easy record, say 854,300 qtls., against 729,300 last year, 804,500 in 1911 (the previous record), and 748,500 qtls. in 1910. In spite of this, however, the Gold Coast's exports for the eleven months "topped" the whole of the Guayaquil output for the year. Although Bahia, with its 29,000 tons exported this year, leaves 1912, with 24,600 tons, considerably behind, it is, in its turn, still more behind 1911, with 34,700 tons.

The order of importance in output, quoting the *Gordian* throughout, is:—

	1913	1912	1911	Tons
Gold Coast	47,927	39,549	40,642	(1,000 kilos)
Guayaquil	39,357	33,013	37,205	"
San Thomé	35,118	35,512	30,453	"
Bahia	29,001	24,674	34,690	"
Trinidad	21,780	18,878	21,220	"
San Domingo	19,217	39,549	40,642	"
Comparative totals	192,400	191,175	204,852	"

Against this, the consumption, in English tons, runs:—

	1913.	1912.	1911.	tons
U.S.A.	65,049	65,505	58,037	tons
Germany	50,672	54,217	50,054	"
U.K.	27,151	27,608	24,996	"
France	27,080	26,467	26,909	"
Holland	29,849	24,548	23,165	"
Belgium	6,106	6,881	5,409	"
Comparative totals	205,907	205,226	188,570	"

These figures (of consumption) show that the United Kingdom, instead of improving her output of 871 tons increase over 1912, as shown at the end of July, closes the year as much as 557 tons behind. Whose fault this is, I leave others to say; but all the same, it is a regrettable fact, as the imports of foreign manufactured are nearly 1,200 tons ahead. The U.S.A. pulled in heavily of cocoa during the last four months of the year, say (in round figures) 17,800 tons, against 11,649 last year, and 9,964 tons in 1912. Instead of being badly behind, as she at one time promised to be, America therefore almost caught up with the deliveries in 1912, which is more than Germany can show. I associate Holland's substantial increase as being helped by our larger imports of foreign manufactured.

For the sake of comparison at some future date, I had better include the consumption figures, as usual, for the United Kingdom, say:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Dec. 31st) Tons.
Jan.-Dec., 1911—	33,046	24,996	6,689	10,144
„ „ 1912—	33,606	27,608	6,155	9,066
„ „ 1913—	35,168	27,151	6,778	10,195
Incr.	1,562	Decr. 457	Incr. 623	Incr. 1,129

Foreign Manufactured—	Landed. December only.	Del'd H.C. January-December.	Landed. January-December.	Del'd H.C. January-December.
1913 ...	825 ...	795 ...	12,331 ...	11,824 tons
1912 ...	1,102 ...	1,012 ...	10,567 ...	10,686 „
1911 ...	771 ...	790 ...	8,223 ...	7,568 „

Before coming to the present ratio of values, I would like to call attention to the following paragraph out of the *Times of Ceylon*, showing how careful cultivation caused the Ceylon cocoa to realize what we are told were record prices:—

“The Department of Agriculture (Ceylon) has secured a record price for cocoa produced at the Experiment Station at Peradeniya. It has disposed of a large consignment at Rs. 62.75 (say 84s.) per cwt., while the price for the ordinary market cocoa was Rs. 40. The cocoa was of superior quality, the result of careful cultivation and curing. The trees were manured and pruned, and bore very heavy crops, the pods and beans being larger and better than those produced by trees that were not treated, while the beans were carefully cured. The consignment was made up mostly of Forastero, with Nicaraguan and Amelonado in smaller quantities. Details of cultivation and curing, which Mr. D. S. Corlett, the Superintendent of the Experiment Station, might publish in his report for the year, should be of great interest to cocoa planters.”

Sales made since the opening of the year show a substantial drop, and our readers should compare the following quotations with those given in our November and December issues to realize the full extent of the drop in values:—

Trinidads.—Fine to superior marks have been selling at 68s. to 71s., mid. red at 64s., but at the sales on January 13th prices dropped to 60s. for mid. red, 61s. for good mid. red, and 62s. to 63s. for fine marks.

Grenadas.—None were offered previous to January 13th, but before that fine marks had been selling at 60s. to 61s. 6d.; ordinary unfermented to good fair fermented, 58s. to 59s. 6d. In face of the fall in Trinidads this growth must also be written down.

Costa Rica.—Fair reddish sold at 56s. 6d., so good red should be worth 58s. 6d. to 59s.

Jamaica, St. Lucia and fine Dominicas should be worth 58s. to 60s., according to quality.

Bahia.—Fine superior sold at 61s. 6d. for some 600 bags, but that was before the last drop in Trinidads.

British West Africa last sold up at Liverpool at 52s. 6d. to 54s. 6d.

Guayaquil.—Arriba has been selling at 70s., and 63s. for fine Caraquez; fine Arriba is nominally valued at 73s. Heavy receipts continue from this centre, say 45,000 qtls. to mid-January, against 12,500 last year, and 21,000 in 1912.

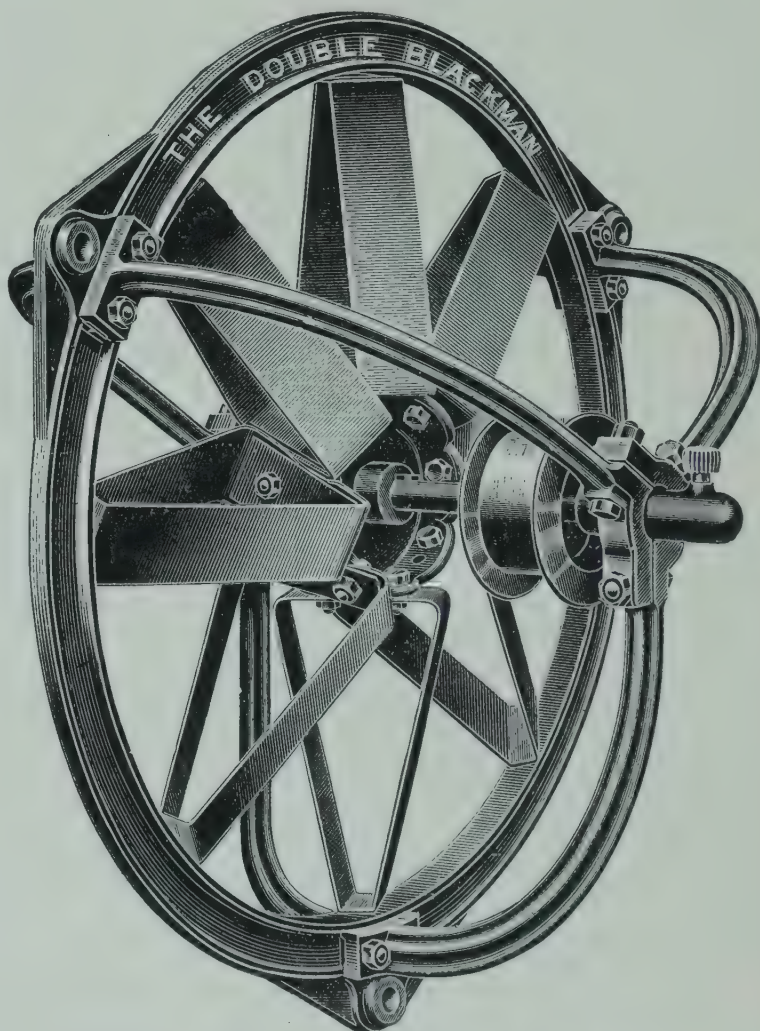
Puerto Cabello.—Good clayed realized 90s., and fair 81s.

Ceylon.—Larger receipts are now coming to hand with the New Crop. Owing to this, prices are falling away, the latest sales including good bold at 78s., fair medium 72s., and ordinary kinds 68s.

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Our Books.

PRESSURE of space has prevented us from inserting in these columns, as we wished to have done, the latest press notices on our last two books, viz., "The Fermentation of Cacao," and the second edition of "Coco-nuts—the Consols of the East." We have, however, included some of them in our advertisement pages, xxviii and xxxiii, to which we must refer our readers.

We take this opportunity of informing our readers that, with our March issue, we hope to start a series of articles on "The Practice of Cacao Fermentation," by Mr. Arthur W. Knapp, B.Sc.Lond., B.Sc.Birm., F.I.C., who has had both a scientific training on this side as well as practical experience in the Tropics, and so should be well able to discuss the subject. We only regret that the treatise did not come to hand in time to include in our book.

The King and Queen to visit Messrs. Levers, Ltd.

WE understand that, during their coming tour through Cheshire next month, King George and Queen Mary will visit Port Sunlight and watch a portion of the vast army employed there at work making soap. The date is fixed for March 25th, and their Majesties are timed to reach Port Sunlight at 2 p.m., where they will be met by Sir Wm. Lever (who has just returned from his trip to Australia and the South Seas) and by other directors of Port Sunlight. After inspecting the works, the Royal party, we understand, will motor to Hulme Hall, where the King, by pressing an electric button, will lay the foundation-stone of the memorial to Lady Lever.

Royalty to Open the International Rubber and Tropical Exhibition.

PRINCE ARTHUR OF CONNAUGHT, on June 24th, will open the Rubber, Cotton, Fibres, etc., Exhibition, of which His Majesty the King is patron. Mr. Lewis Harcourt, M.P., Secretary of State for the Colonies, will also be present and speak, and a large number of the leading men interested in tropical development will be present. This, together with the fact that thirty-five British and foreign Governments will be exhibiting, as well as many important associations and companies, also manufacturers and others connected with the industries that come within the scope of the exhibition, will make the Exhibition and Congresses far and away the most important events of the year from an Imperial as well as an International point of view.

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An Agricultural College for the West Indies.

REFERRING to our remarks in the December issue (p. 222) *re* the chances of Trinidad, B.W.I., getting its agricultural college, if only by starting the nucleus of one, the following extract from the *Proceedings of the Agricultural Society* of that island is highly interesting if only on account of the prominence it gives to the possibility of the Federated Malay States, and not only Ceylon, securing such a college. On paper, at any rate, says our West Indian contemporary, the claims of the Federated Malay States are formidable. Since that area has 27,700 square miles, a population of one million, imports £12,000,000 and exports £22,000,000, we could hardly have expected the preference, however we may regret, not having been accorded it. The news was communicated in the following despatch from the Secretary of State to the Governor, which His Excellency was good enough to direct should be communicated for the information of the Society:—

“Downing Street, September 23rd, 1913.

“SIR,—I have the honour to acknowledge the receipt of Mr. Knaggs's despatch No. 337, of August 18th, forwarding a copy of a report by the Agricultural Society's Standing Committee on Agricultural Education, in which the establishment of a tropical agricultural college in Trinidad is advocated.

“(2) Proposals are under consideration for the establishment of a tropical agricultural college in the Federated Malay States, and I fear that this fact would make it impossible to obtain on an adequate scale outside financial assistance for a similar establishment in Trinidad. I should, however, welcome any proposals for widening the sphere of existing educational centres in Trinidad so as to include training in the theory and practice of tropical agriculture for which there are exceptional facilities in the Colony.

“I have the honour, &c.,

“L. HARCOURT.

“H.E. The Governor, Sir G. R. Le Hunte, G.C.M.G., &c., &c.”

It has been urged that a college was not needed in Ceylon because India has several, six or eight or more. To prove this one friend sent us a list, but to this we replied that, whether India has eight or eighty agricultural colleges, she still needs more to house her own folks, and certainly cannot take outside students to be housed. The *Madras Mail* surely confirms what we have just said, when it tells us that “Among the multitude of questions connected with the improvement of Indian agriculture, that of agricultural education stands undoubtedly in the front rank as regards importance. The Imperial and the various Local Governments have shown clearly enough their appreciation of this fact by the large sums of money which they have spent and are spending on the equipment and maintenance of the agricultural colleges.* The Agricultural Departments themselves have found the development of a system of agricultural education, which is really suited to Indian conditions and needs, to be one of the most difficult problems with which they are confronted. A perusal of the

annual reports of the various provincial departments and the reports on the progress of agriculture in India issued by the Imperial Department shows clearly enough that our Indian agricultural colleges are being attended to a decidedly disquieting[†] extent by those who mainly wish to use an agricultural diploma as a stepping-stone to Government service. The serious nature of the situation, from the point of view of agricultural experts in India, can be gauged from the fact that agricultural education formed one of the most important questions for discussion at the meeting of the Agricultural Board, which commenced at Coimbatore on December 8th. The same question forms the subject of a very interesting report which has just been issued by the Mysore Department of Agriculture. It is written by Dr. Coleman, the Director of Agriculture, and contains the results of an extended tour of investigation in various countries of Europe, in America, and in Japan. The chief object of the tour was to ascertain what agencies and methods in connection with agricultural education have proved of most practical use in the various countries visited.” We cannot, therefore, agree that the West Indies must go without a college, for we maintain that, on the contrary, with the present Pan-Imperial movement that is making itself so strong a force throughout the Empire, we *must* (it is rude to say “shall”) have a college in the West Indies, and that, too, before very long.

With regard to the F.M.S., it will be remembered that at the Straits Dinner, held in London early in December, Sir Henry McCallum, a leading, in fact the leading spirit as regards securing a college for Ceylon, was in the chair as an ex-Straits Civil Servant, and among those present were Sir John Anderson, Permanent Secretary at the Colonial Office, and Sir Owen Philipps, Chairman of the Royal Mail Steam Packet Co. and allied lines. In his speech, Sir Henry McCallum paid a high tribute to the F.M.S., and suggested that the School of Agriculture should be financed until the rubber companies and those who will benefit are able to contribute to its upkeep. We hope this will be done both in Malaya and the West Indies, where, as we pointed out in December (p. 222), the nucleus of an agricultural college could be started at once and at a comparatively small cost.

Meanwhile as regards Ceylon's chance we understand that the London committee for promoting the establishment of a college of tropical agriculture in Ceylon has held several meetings under the chairmanship of Sir Henry McCallum. The committee has drawn up a scheme which is now being considered in Ceylon; and Professor Wyndham Dunstan, who is visiting that island, and acting as the representative of the committee in conference with the Board of Agriculture and the Planters' Association in the Colony, visited the site chosen for the college when built. In face of the influential support which is being afforded to the idea, it is hoped that it will be found possible to give effect to the scheme in Ceylon in the course of this year.

[†] Meaning, we take it, that the colleges are threatened with overcrowding. Again, with a college in the West Indies, students could be exchanged, to the great advantage both of East and West, as Dr. Francis Watts, Imperial Commissioner for Agriculture for the West Indies, can show, since he had one sent to him at Barbados to be trained even without a college. With an agricultural college in the West Indies, therefore, far-reaching benefits will accrue, benefits by no means confined to the West Indies or South America.

* Hear, hear! But if in India why not in the West Indies?—ED., T.L.

Sugar Cultivation in India.

IN a recent issue of the *Pioneer* of India there appeared an interesting article by Mr. Runar Olsson Seffer on the cultivation and fertilization of the sugar cane. We are the more interested in this owing to the fact that Mr. Seffer is personally known to us as one who has not only a thorough knowledge of tropical agriculture in all its branches, but has for some time past made a special study of sugar-cane cultivation.

We have more than once called attention to the necessity of good cultivation and liberal fertilizing for successful cane growing, and we have pointed out especially the immense possibilities existing for raising the present very poor average of cane crops grown in India. With her enormous and increasing local consumption, it is imperative that India should produce better crops of cane and sugar than she does at present, and we cannot insist too often that this can be done and should be done. As Mr. Seffer has apparently discovered, in India itself heavy manuring has given extraordinary profits, and therefore presumably heavy yields, though no actual figures are given, except as to the actual net profit. No doubt the varying conditions met with in India make it difficult to lay down any hard and fast rules as to cultivation and fertilizing, but the fact remains that, where adopted, heavy manuring has paid handsomely, and of this other countries offer innumerable proofs. Mr. Seffer modestly disclaims any intention of doing more than point out the possibilities of the industry in India, owing to his short experience of that country, but his suggestions as to improvements in cultivation and fertilizing cannot fail to carry weight in view of his unrivalled experience in other cane-producing countries. We need only refer to his remarks on the wonderful development in Hawaii, which was largely due to irrigation and judicious fertilizing, in addition to better methods of cultivation, modern mills, and machinery generally. Thirty years ago no one dreamed of an annual output of more than 100,000 tons per annum in Hawaii, nor could this have been exceeded under the then conditions. Yet in 1912 no less than 600,000 tons of centrifugal sugar was produced from some 150,000 acres! This is sufficient proof of what progressive methods can effect, and it may safely be said the same can be done—even if to a lesser extent—in India and other countries where the yield is yet low. Cuba is waking up to her possibilities and many improvements in cultivation, machinery, &c., have been and are being made, though they have not yet made the same improvement in their methods of fertilizing to which the prosperity of Hawaii is so largely due. To illustrate this we may say that the Hawaiian reports show that the most profitable fertilization as a rule was that in which 1,200 lbs. of mixed fertilizer and 300 lbs. of nitrate of soda were applied to the acre. This dressing produced close on 5½ tons of sugar to the acre, and whereas the 1,200 lbs. of mixed fertilizer produced only 4 tons, the addition of the 300 lbs. of nitrate of soda added nearly 1½ tons more.

In other cases as much as 7½ tons of sugar per acre were obtained by the above dressings of mixed fertilizer and nitrate of soda. We may mention that this mixed fertilizer contained a very high percentage of nitrogen. We mention this to illustrate the remarks of the Director of the Experiment Station in Hawaii, "that it

has now been demonstrated by actual field tests that all our different types of soil, even those of high nitrogen content, will give increased returns from fertilizers containing a relatively large amount of readily active nitrogen irrespective of conditions of large or small rainfall." It is well known to what perfection the cane has been brought in the Hawaiian Islands, and it is evident that this is largely due to a liberal application of high-class fertilizers. If then India wishes to occupy her rightful position among the sugar-producing countries of the world, she must not only make sure of choosing the most profitable varieties of cane, but must also adopt the most modern methods of cultivation and use the highest grade fertilizers, which are always the cheapest in the end.

By these means, and with the additional advantages of cheap and plentiful labour, irrigation, and a sympathetic Government, one cannot doubt that India may double and even treble her present output of sugar, and again become an exporter of that commodity, instead of an importer as at present.

The Production of Tungsten in the Tropics.

IN the admirably drawn up Supplement of "Trade Products of the British Empire," issued by the London Chamber of Commerce with their *Journal* last year, we see that tungsten, which is used chiefly in the manufacture of steel that will not lose its temper when heated, but is more generally known for supplying the filaments for tungsten incandescent lamps, comes from wolfram, now a product of some importance in the Federated Malay States, the exports in 1912 amounting to 2,815 piculs, valued at \$84,500, compared with 3,755 piculs, valued at \$140,217, in 1911. The production of tungsten ore in 1911 in the United States amounted to 1,139 tons of concentrates, valued at £81,417.

Wolfram and scheelite, the principal ores of tungsten, are both mined to a small extent in New South Wales and Queensland. Wolfram is also mined in Victoria, in the Northern Territory of Australia and in Tasmania. In Queensland in 1911, 539 tons of wolfram, valued at £54,163, were produced, and 5 tons of scheelite, valued at £394. The exports of wolfram from Victoria in 1911 were 18 tons, valued at £1,309.

In India there was a marked activity in 1911 in the wolfram industry in Tavoy, and also to some extent in Mergui, and the output of ore rose from 395 tons in 1910 to 1,308 tons, valued at £99,989, in the year 1911. Work is being carried on at a large number of localities, chiefly in the mountains to the east and north-east of Tavoy. In addition to a number of Chinese and Burmese, working mostly on a small scale, certain European companies are engaged in opening up some of the larger deposits.

ACCORDING to the *Cabinet Maker and Complete House Furnisher*, the enormous demand for antique furniture has led to copying or inventing "antiques" with structural faults and the falsifying of surfaces by dirt and apparent decay. To those who are really skilled in this sort of thing, the profits and consequent inducement to make and supply "antiques" are enormous.

Tobacco Planting.

PART III.

CONTINUING our discussion regarding the manuring of tobacco, which we had to bring to a somewhat abrupt close last month, other friends who ship tobacco fertilizers to different markets tell us that the qualities and formulas vary according to the climate; even in the U.S.A., where experience in growing is considerable, one finds great variations in manures used. In the undernoted States, planters' practice varies as shown:—

State	Ammonia varies between	P ₂ O ₅ varies between	K ₂ O varies between
Connecticut ...	2 to 7½	3 to 9	1 to 11
Massachusetts ...	2 „ 7	3 „ 9	1 „ 11
N. Carolina ...	2 „ 6	4 „ 9	2 „ 10

Where practical experts differ to such an extent it is difficult to give any recommendation for general use.

The general rule for practice for tobacco planters to follow may be stated thus: Nitrogen 4 to 6 parts, potash 8 to 15 parts, and phosphoric acid 1 to 3 parts.

This may be more concisely expressed as follows:—

Ammonia ...	4 to 5 per cent.
Potash ...	8 to 9 „
Available phosphoric acid	2 to 4 „

Commercial fertilizers are valuable as plant food only to the extent that they contain nitrogen, potash and available phosphoric acid, provided always that proper proportions of these ingredients are used. An excessive amount of any one of these three plant foods in a fertilizer will not make up the loss caused by the lack of either of the other.

The sources from which the different forms of plant food are obtained are of the utmost importance with tobacco in affecting the results. In selecting potash, sulphate of potash should always be applied; that grade known as 96 per cent. sulphate of potash would be the best suited for the purpose. The forms of potash such as muriate of potash and kainit, both of which contain large quantities of chlorine, should never be used for tobacco, as they exert an injurious influence on the burning quality of the leaf.

To make a fertilizer of the composition recommended, that is, 5 per cent. of ammonia, 9 per cent. potash, and 4 per cent. available phosphoric acid, which is a well balanced mixture for tobacco, the following materials can be used to make a ton:—

Cotton seed meal ...	1,100 lb.
Sulphate of potash (96 per cent.) ...	350 lb.
Acid phosphate or Thomas' phosphate powder ...	550 lb.
	2,000 lb.

As to the amount of the above mixture to be applied per acre, this varies in different countries. On an average, though, from 1,000 to 1,500 lb. per acre could be used to advantage. In Connecticut, the tobacco planters, as a rule, use as much as 3,000 lb. per acre of a fertilizer of even higher grade than that above recommended. A little experimenting on the part of each planter, however, will soon indicate the amount which can be used with the greatest profit, and growers must not grudge the time and money spent on making experiments, as without their aid they will never discover how to produce the best-paying leaf at the least cost for manures and cultivation. In arranging these trials the following tables should be kept in mind:—

AVERAGE COMPOSITION OF THE MOST IMPORTANT FARM MANURES.

Farm manures	Nitrogen. Per cent.	Equivalent in ammonia. Per cent.	Potash (K ₂ O) per cent.	Phosphoric acid. Total per cent.	Lime (CaO) per cent.
Cow manure (fresh)...	0.34	0.41	0.40	0.16	0.31
Horse manure (fresh)	0.58	0.70	0.53	0.28	0.21
Sheep manure (fresh)	0.83	1.00	0.67	0.23	0.33
Hog manure (fresh)...	0.45	0.54	0.60	0.19	0.08
Hen-dung (fresh) ...	1.63	1.98	0.85	1.54	0.21
Mixed stable manure	0.50	0.60	0.63	0.26	0.70

COMPOSITION OF FERTILIZER MATERIALS USED AS SOURCES OF NITROGEN.

	Nitrogen. Per cent.	Equivalent in Ammonia. Per cent.	Potash (K ₂ O) per cent.	Phosphoric acid total. Per cent.
Nitrate of soda ...	15 to 16	18 to 19½	...	...
Nitrolim ...	18	21.85	...	...
Sulphate of ammonia	19 to 22	23 to 26	...	...
Dried fish scrap ...	9½ „ 11	11½ „ 13½	...	6 to 8
Cotton seed meal ...	6½ „ 7½	8 „ 9	1½	2 „
Castor poonac ...	5 „ 6	6 „ 7½	1	2
Tobacco stems ...	2 „ 3	2½ „ 4	5 to 8	About 1

(To be continued.)

WE are glad to see that the National Mutual Life Assurance Society of London has had the reward of the enterprise and push shown by the Directors and the Actuary, Mr. Geoffrey Marks, who, by the way, is an elder brother of Mr. Oliver Marks, Secretary to the Resident at Perak, F.M.S., and of Mr. John Marks, of Ceylon. The members (for, as all the profits are divided among the policy-holders, there are of course no shareholders) of the Office are to be congratulated on receiving a bonus of 36s. per cent. per annum on sums assured and the previous bonuses, this, too, in addition to the Society carrying forward 30 per cent. of the ascertained surplus. This enables a £500 policy, carrying £118 8s. of previous bonuses, to receive a further £49 3s., making £167 11s. bonus in all, so that in event of death the legatee will receive £667 11s. against less than £250 paid in for premiums.

THE progress report of the Peradeniya Experiment Station tells us that a good sample of copra has been obtained by carefully washing out the nuts after breaking and drying in the sun. It was reported on in Colombo as first grade and would command top price. Good clear oil was also obtained from this copra.

In former issues we have urged our readers to experiment with washing their copra after opening the nuts as the surface moisture would soon evaporate and dry off, whilst in the process of washing the dried milk, which is so liable to attract moulds, would be removed as well as any dirt, sand, or finger-marks, all of which in the aggregate go to spoil the appearance of the finished article. For these reasons we believe it would pay to wash the copra in some cases before drying it.

Coffee Notes.

A LEADING authority on Sao Paulo coffee writes us as follows regarding our paragraph on p. 202 in last November's issue, entitled "Why the English are prejudiced against coffee," in which we called attention to the coffee supplied to the Metropolitan Asylums Board being so unpalatable that it was not considered good enough for the inmates of the lunatic asylums.

Our friend writes as follows: "It would be most interesting to hear from you when you are able to reply to the question which is suggested, 'We wonder what that coffee was made of?'" Meanwhile, without going into the question of chicory or other adulterants, it is very important that public authorities, who are undoubtedly large buyers of coffee, should appreciate the deterioration that takes place in roasted coffee. The aroma and fragrance of coffee served under perfect conditions has such a charm that, apart from the gently stimulating effects, it will always take an important place in the beverages that form our diet.

"The Sao Paulo Pure Coffee Company was founded by the Government of the State of Sao Paulo to propagate the consumption of pure coffee in the United Kingdom, and to attain this object very great care is taken in the selection, roasting and packing of 'Fazenda' coffee, and each tin bears a seal and guarantee of purity. The doubly sealed air-tight tin which the Company has adopted ensures the aroma and fragrance of the coffee being retained for an indefinite period, and it has been suggested that the experts who buy for public institutions, such as you describe, should take into consideration not only the merits of the samples of coffee tasted at the time of purchase, but satisfy themselves as to the keeping properties, so that the coffee may be ordered which has proved that it is capable of retaining its aroma up to the period that it is required for consumption."

Coffee-pulping and drying in Costa Rica is described as follows in the *Jamaica Bulletin* by Mr. B. S. Gossett, who visited some of the coffee estates at that centre:—

"Three pulpers are used bedded in concrete. Two on a higher level pulp the cherry coffee, which is led from the receiving tank by concrete gutters into the hoppers of the pulpers, and the pulped coffee is carried by water into a rotary iron washing screen or cylinder which separates the small beans and tails, and these are carried into a third pulper and pulped over again. The parchment coffee is in consequence even in size, as it is sized by the screen, and it can be more easily cured.

"The pulped coffee is carried by water into concrete fermenting tanks, of which there are a large number. When fermented it is carried in broad shallow concrete gutters which wind backwards and forwards at an easy gradient for a considerable distance and washed in these gutters by men with wooden racks in a very simple and easy fashion. When sufficiently washed it is let out on the barbecues from a delivery tank and the water dried out of it by the sun. Some places use centrifugals to get the water out more quickly. It is then put into a rotary Guardiola dryer and kept going for about forty-eight hours when it is fit for shipment. Too hasty drying with too great heat spoils the quality."

The Cinema as an Educational Medium.

SOME little time back, when we were keenly advocating the utilization of the cinematograph to educate the public, adult and juvenile alike, as to the geographical and economic importance of this vast Empire of ours, our Editor was elected a member of the Educational Committee of the Cinema Congress held shortly afterwards in London. So far as we know this Congress led to no results, but individual efforts have been made to follow along the lines we indicated, although, so far, much more slowly than we care to see. Why do not the large soap, chocolate, margarine and rubber manufacturers, rice millers, tea blenders, furriers and others, take the public for trips over the cinema to show how their goods or raw materials are obtained? Messrs. Lemco or Messrs. Bovril could, we are sure, teach us much about farming and stock raising by such trips, and at the same time show the public what splendid beasts they own on their stock farms, and the conditions amidst which they exist.

Believing in this principle, Mr. Harold Sintzenich, as stated in our issue of December, 1912, visited Jamaica to take kinemacolor pictures of the life and industries of that island, and was five months carefully studying the situation, making arrangements to take the photographs and finally doing so. Consequent on this we had the pleasure this month of being present at a private view of fourteen of the films taken, and at the conclusion of the performance Mr. Sintzenich was warmly congratulated on the results of his work. The pictures certainly pleased us, both on account of the luxuriant scenery as well as for that amusement which native life always causes to visitors to the West Indies; all reproduced, be it remembered, in life-like colours—the man's hand, for instance, that pulped a coffee cherry was an exact tint, darker outside and passably fair inside, and the negresses' hands as they wove the yippa-yappa hats as well as the patterns of the bandanna handkerchiefs on their heads were equally good. Here we saw sugar-cane growing, being trashed and carried, and would have seen the sugar made, but the light inside the factory prevented this. We saw the yippa palm leaf, the strips boiled and bleached, the hat being woven and then blocked. The coffee bushes covered with cherries, and the branch held out by a man, showed the colouring, "red as a cherry," to perfection, and this was repeated in a dish of fruit. Next to us sat Mr. Horton, another representative of the firm who took the Panama Canal films that had such a run at the Scala Theatre about a year ago. We hope Mr. Urban will send other members of his staff to the Tropics to bring home equally good films of the many other industries to be found out there, and without which both the trade and the food supplies of this country would fall to "starvation point." The more we educate the public up to realize this the better.

THE *Union Gazette* (Pretoria) of December 15th publishes revised regulations concerning the leasing of Crown lands in Natal and Zululand which have been set apart for sugar cultivation. The land will only be leased to European settlers not under 18 years of age who have been approved by the Land Board. Leases are to be for 99 years, and no block of land is to exceed 500 acres in extent.

Tea Notes.

THE Bank Rate came down from 4 per cent. to 3 per cent. on January 29th, following upon a drop of $\frac{1}{2}$ per cent. in the week previous. Meanwhile, the stock market has been busy. "Who is making all the money?" asked Messrs. Zorn and Leigh-Hunt, "as during the past week millions of pounds—*literally millions of pounds*—have been added to the value of stocks and shares in the markets. Consols a week ago stood at $73\frac{1}{4}$; as we write the price is 76, and the rise of $2\frac{1}{4}$ in Consols alone represents an increase in the capital value of over ten million pounds sterling. When you remember that the same sort of movement has been going on, not in dozens or scores of prices, but in thousands of them one wonders what the total gain amounts to."

The opening sales in February, according to Messrs. W. J. and H. Thompson, enjoyed a continuance of the improved demand and stronger tone, and the sales passed with brisk competition and a slight tendency in favour of sellers. Quality is becoming rather more attractive, and the offerings are gradually moving away from a monotonously plain level.

Indian teas show rather an improved tone for nearly all descriptions. There was a good general demand and prices at times showed a slight tendency to advance. Good liquoring kinds generally were well competed for and realized full rates; rather more attention was paid to medium qualities at and under 9d. per lb., while common descriptions were fully steady. Although here and there some irregularity was noticeable, taken all round tea was not easier to buy, and there was no material alteration in values to record. The average for the whole sale on Garden account was 9d. per lb., compared with $9\frac{1}{4}$ d. a year ago. With Ceylons the tone was quite firm, bidding was brisk throughout, and buyers who had been unable to get in at previous rates not infrequently gave an advance of a farthing to secure desirable parcels. The average for Ceylons on Garden account was also 9d., against $9\frac{1}{4}$ d. last year.

We shall probably soon have to chronicle the advent of a new producing territory into the competition for the world's trade, report Messrs. McMeekin and Co., in their exhaustive review of the tea industry for 1913, as a considerable area in the island of Sumatra has been planted out with tea, and it is reported to be growing exceedingly well.

The same report also discusses the retail trade now being done by the multiple shops on this side in popular teas and coco-nut butter as follows:—

"The severe competition of the multiple shop concerns against the individual trader still continues, but these are now faced by a problem that may cause some modification. So long as margarine was the leading line, yielding a high rate of profit, it was all very well to tack on tea to it for a fraction on the turnover. The great success of introducing margarine as an important item in our food supplies has so raised the cost of the materials from which it is produced that the profit obtainable by the retailer has much diminished. If tea and margarine are both to maintain the advance established on the first costs, then a revision of the retail prices must come for one or both, provided the leading multiple shop concerns are to

maintain their dividends at anything like the recent levels. The general prosperity and comfort which the great body of the population have been enjoying has shown itself in the tea trade. The fractional fall in consumption per person which was seen in 1912 has been more than recovered. There can be little doubt that the weekly distributions made all over the kingdom of money in connection with the Old Age Pensions and the Insurance Act have greatly benefited retail trade. There is now money to spend in the quarters where and at the times when formerly it was generally most scarce, and the teapot is the constant resort of the old and the ailing amongst the poorer classes. The general advance in the cost of living has not yet shown much modification, but the lack of prosperity in other countries is likely, sooner or later, to lead to an increased export from them of the necessities of existence. We have, therefore, reason to look for some reduction before long. Any lowering of the general cost of living may still further increase the demand for tea."

All who have been passing through Paris of late years have been struck with the way afternoon tea has become the fashion, so that the tea rooms are uncomfortably crowded in the afternoon throughout the city. This is, we believe, largely due to the Indian tea planters' patience and push, and, being so, we hope they are benefiting as they deserve to do by the boom. For this reason we beg to call attention to a remarkable sample of tea, said to be drunk in Paris, which was shown to us a few days ago by a merchant interested in the sale of the genuine article over there. At first we thought the sample was of immature cloves, but soon noticed that it was of immature tea-seed capsules with (we are told) the petals removed, leaving a cured tea-coloured capsule that had failed to develop. The retail price of this "perfect tea" is stated to be 8 francs a kilo, or about 2s. 10d. per lb., and although, of course, it is a product of the tea plant, it can hardly be described as tea for consumption, and in any case its sale is certain to prejudice Paris against the product that the Indian planters have gone to such trouble and expense to make so popular in that city and elsewhere.

Where Rubber Paving is Needed.

MANCHESTER'S PLEA FOR MORE NOISELESS PAVING.

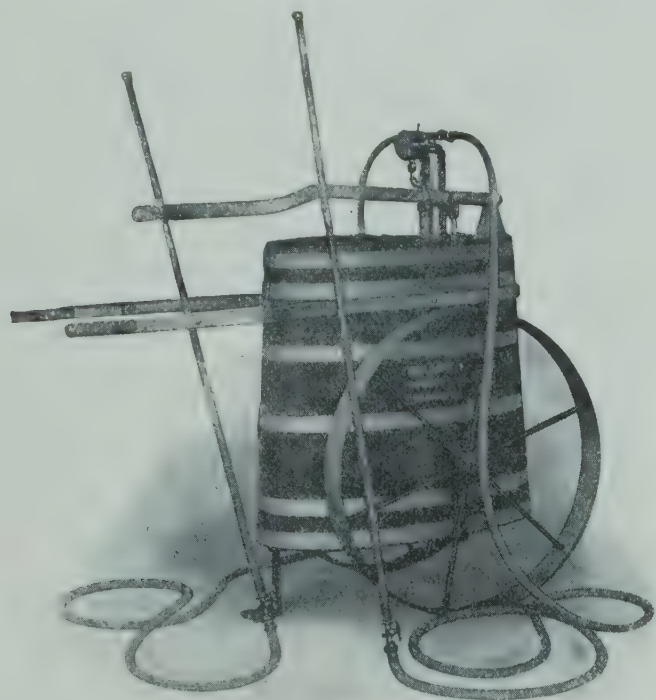
ACCORDING to the *Manchester Guardian*, the association recently formed to press upon the public and the authorities the importance of more vigorous action towards the betterment of Manchester, waited upon the Lord Mayor of that city to set forth, among other things, the need of laying down some less noisy form of pavement than granite around the public elementary schools, one of the speakers stating that, rightly or wrongly, Manchester had the unenviable reputation of being the noisiest and dirtiest town in the United Kingdom. This the Lord Mayor denied, but the report generally showed the grievance to be a genuine one, and with rubber at its present low price we would suggest that Manchester, since it can boast of having two of the leading rubber engineers in its midst, ought surely to be one of the first cities to take to rubber paving, when the public cry out for a noiseless pavement in this way.

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART III.

The Spraying Machines of the Four Oaks Spraying Machine Co.

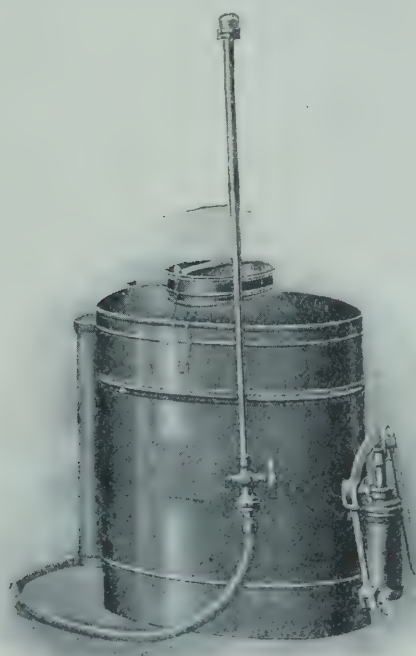
TROPICAL plant diseases, like all insect and fungoid diseases, are kept away by, or yield to, only one remedy—efficient spraying. Efficient spraying can



"Four Oaks" Spraying Machine, "Battle" pattern. Made in two sizes, 18 and 25 gallons. Most powerful pump. Supplied in large numbers to planters.

only be carried out by using an efficient and suitable machine, and an efficient and suitable nozzle.

This has been realized from the first by the "Four Oaks" Spraying Machine Company, with their well-



This is the Knapsack Sprayer No. 3 referred to in the Trial of Sprayers. (See advertisement, p. xvi.)

known machines, which include every type of spraying machine and nozzle, and the harassed grower has only to write to them and state the class of work he wants

to do, and they will give him their expert advice as to the most suitable type of machine and nozzle to meet his individual requirements, and be able to supply the same in the best quality at the lowest cost, as they have made a scientific study of the subject, and have a sufficiently wide range of machines and nozzles to be able to advise and supply the most suitable one for each special case. For these the firm has, during the past four years, been awarded over sixty gold and silver medals, nearly all in competitions open to the world.*

In an article of this length it is possible to describe and give particulars of only a few of the chief types of their machines, but further particulars will be found in their advertisement (p. xvi). We recommend our readers, however, to write to the makers at "Four Oaks" Works, near Birmingham, England, for full particulars and complete catalogues; only when writing please state the particular class of work you are interested in.

Their spraying syringes are well known, but we should like to call special attention to their famous



"Four Oaks" Spraying Machine, "Herrod" model. Made in two sizes, 10 and 18 gallons. Specially designed to go into the most closely grown plantations.

Undentable Syringes, having a corrugated protective covering, which renders them undentable and provides a firm grip for the hand.

In knapsack sprayers the "Four Oaks" Company stand supreme in every type. They were the first firm to place on the market a knapsack with a brass pump and brass ball valves, a boon greatly appreciated by planters, who had had endless trouble in the past with rubber valves and rubber diaphragms. This standard machine is their Knapsack No. 101. Its chief advantages are the brass pump and brass ball valves, all working parts outside, and ability to give the great pressure essential to effective spraying.

Another knapsack strongly recommended by the Company is their "New Combination" pattern, No. 400 (Patent). This machine has a brass pump, easily removable from container for cleaning, brass ball valves, and is claimed to be the easiest working machine in existence. It has a powerful automatic

* Also see advertisement, p. xvi, for Mr. Rudolph's report on work done in Southern India.

agitator, which prevents the liquid from settling, and has two containers, one fitting inside the other, which enables the machine to be used for any kind of washes. This knapsack can also be used as a bucket type to stand on the ground when desired. Besides the above the Company have also six other styles of knapsack sprayers suitable for different kinds of work, including a pneumatic type, and one with rubber valves for those to whom price is a consideration, whilst the "Streetley" pattern is a convenient little hand pneumatic sprayer holding three pints, and very popular for all kinds of delicate work. Among the bucket type of machines may be mentioned the "Farmer," "Dairyman," and "Royal" patterns.

Of their large machines on wheels planters should note their "Battle" pattern, which has already proved popular in the Tropics. This is a machine with an elliptical-shaped oak container mounted on very large broad wheels to ensure easy traction. It is made in two sizes, 18 gallons and 25 gallons. The container being oak can be used for any kind of washes, and the machine is fitted with an agitator which keeps the liquid effectively mixed. The pump, however, is one of the great features of this machine. It is so designed that the bucket works entirely outside the liquid, and has very large brass ball valves which cannot choke.

Other machines on wheels are the "Herrod" model (illustrated), designed to go down narrow rows in plantations, and the "Handy," "Shenstone," "Stafford," and "Little Giant" patterns.

The wonderful range of nozzles offered is one of this firm's specialities. There is a very large number of types suitable for every class of work. This collection of nozzles took the highest award at the Royal Horticultural Society's trials last year.

MAKERS of earth-boring implements or augers should keep an eye on Ceylon, where, we are told, one of the auger type of implements was experimented with, and rather liked by the planters, especially for making post holes. If the Ceylon planters take to these handy-looking implements other important centres will no doubt try them as well.

Economic Zoology.

Our Motto—"Utilization, not Extermination."

PLUMAGE PROHIBITION METHODS.

THOSE who, like ourselves, have been centring their attention on America, where a drastic measure *re* the importation of plumage for millinery purposes has passed into law, and an even more drastic construction has

been put upon it by the Customs officials administering the Act,* would be wise to secure a copy of the January issue of *Current Literature*, of New York,† for it contains some excellent *résumés* of the opinion one of the leading American journalists has formed of their new President and his ways. We make this suggestion because, believing in the saying, "Like master, like men," we take it that the Customs would not have gone to the extremes they have done had they not realized that their action would find favour with their superiors; and as President Wilson attended a garden party or other form of social gathering at which his daughters acted in a masque got up by those who wish to stop the traffic in bird-skins, in which the bird-like costume worn by one of the Misses Wilson was shown in an illustrated paper on this side, there can be no doubt that the family is prejudiced against it.

At the same time, discounting all printed reports of the extreme views that President Wilson may have been said to hold on the plumage question, the leading part he and his daughters took at this masque shows that they are strongly opposed to the wearing of birds, whether farmed or not, if specially bred for the millinery trade, even if the

life of the bird is not taken when obtaining the feathers.‡ It would be well, therefore, to take stock



From Circular 4—*Trinidad Mycologist's Report*, 1911.]

Where a Spraying Machine was wanted.

Typical Scene in Trinidad (W.I.) in a District badly affected with Coco-nut Bud-rot.

* See the leading article in our October issue, p. 191, entitled "The Pharisees and the Plume Traders."

† Published at 134-140, West Twenty-ninth Street, New York City, U.S.A.; 25c. per copy, or \$3 a year.

‡ A French buyer of feathers claims that impeyans, if not ospreys, are being farmed in India, and only the surplus male impeyans are killed. In that case, he asks, would not the feathers from such birds be eligible to pass the American Customs? As pointed out in a previous issue, the male impeyans when left to themselves harass the females to a degree that makes it advantageous to reduce the number of males.

of the head of a State that is proving so unreasonable and high-handed in the way they are administering a law that is bound to fail in its prime object, and will cause a reaction against those who are forcing it on to an unwilling majority.

The President, we are told, has "a constitutional aversion to meet those who disagree with him." Two of the leading agitators against the trade in London object to being criticized, or their statements questioned, even when the heckler has been eight years in the centre under discussion (New Guinea), and one, if not both, of the agitators had never been there. Thus is history made.

According to James Creelman, writing in the *Evening Mail*, of New York, instead of the "pitiless publicity" that was looked for, Washington has never known such a secretive President. "Words can hardly express the sense of personal power, isolation, and almost inscrutable secrecy which President Wilson suggests in Washington to-day." This "pale, lean scholar has isolated himself more than any other President in the memory of the present generation. . . . He has close-mouthed, soft-footed personal friends and agents to advise him, several of the most important of them private individuals without official position or responsibility of any sort. Those who obey and support him have ready access to his presence; to others he is practically unreachable, or when he receives them in audience he is cold, secretive, and sometimes cruelly sarcastic."

With this idea of their own President, one does not wonder that unpopular measures are foisted on the American nation, and then administered in a way that can only add to their unpopularity. No good can come, either in America or England, by burking discussion. The Indian Legislative Council, at a time when an American lady was the Vice-reine, behaved in a manner even more secretive than Creelman claims President Wilson to possess, when it passed the now famous Notification of 1902; and the ways of Mr. Hobhouse's Committee, or Conference, are, to our mind, even more unwise, unfair, and ill-advised than are those of our American cousins, bad as things are shown to be in America. The one streak of silver showing behind this black cloud of blind prejudice is that whilst the fanatics have gained the day in America, things are not quite so bad as yet in England, and, let us hope, never will be.

A leading authority in the millinery world of New York, writing on our leading article in the October issue on Mr. Sydney Buxton's attitude towards the plumage trade, says that he has read what we said with interest, and "I see they are worrying the trade in England as they have done on this side.

"You know of course what has passed here, and what the importers as well as the manufacturers are up against. There never has been such pig-headed legislation in the history of this country as that passed in connection with the Tariff Law. What is quite laughable, although extremely vexatious, is the fact that a man can bring over from England a brace of pheasants as food for a friend, but before they are allowed to pass the Customs, he has to give bond that he will take the feathers off and return them to the Custom House, and then he can enter with the birds. Another foolish piece of legislation, or rather interpretation of the law, is that no one can leave the United States wearing the plume

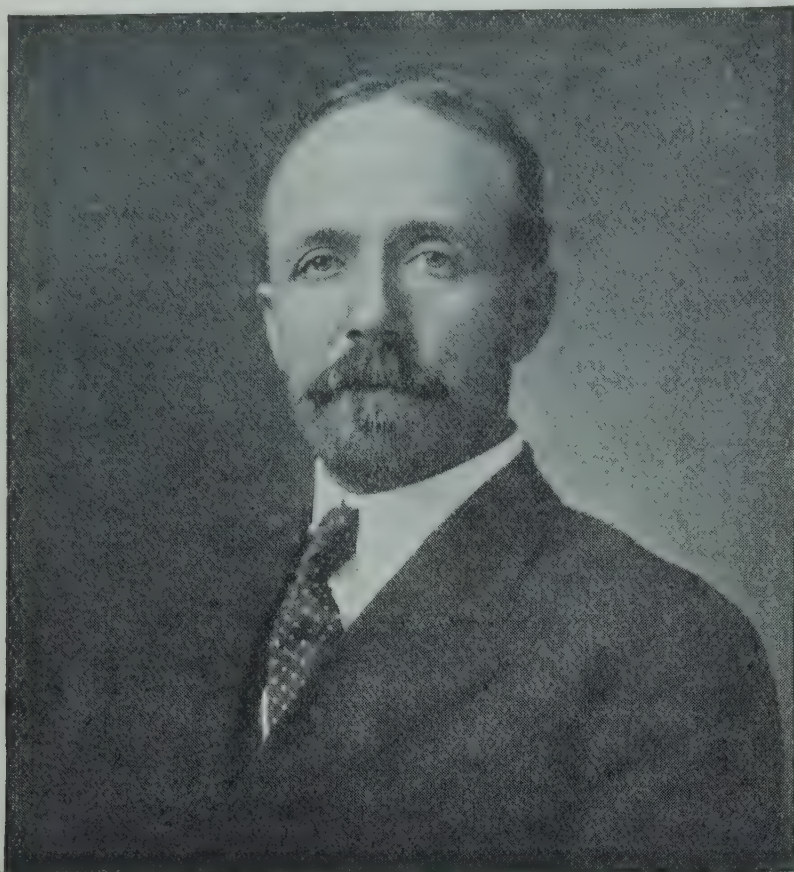
of a wild bird, the importation of which is prohibited by the Government, and on their return pass into America with it. In other words no one can cross the border into Canada wearing a hat trimmed with a bird of paradise or an egret plume and come back with it without having the plume taken from the hat and destroyed by the Customs authorities. As the French say, *C'est incroyable*."

Meanwhile, we hear that those in favour of the extreme methods adopted in New York have been cabling the London extremists to support them. The Zoological Society, which claims to have been instrumental in securing the passage of the measures resulting in the New York Customs behaving as described, now hopes to see this country do the same. We certainly have seen some social revolutions of late years, but we can hardly believe that the Government here will try and dragoon women into wearing what ornaments on their hats a small clique dictates, since they have allowed far more outrageous fashions to prevail unchecked of late.

The millinery trade, claim the American extremists, has adapted itself to the new conditions, and the law is acknowledged to be most beneficial in its results. We do not agree that this statement diagnoses the case correctly, and one authority on the trade here, on the Continent, and in America agrees that the last part of the resolution is pure American "swank." Our opinion is that the millinery trade in America is far from adapting itself to the new conditions, and that since the passing of the prohibition laws there fancy feathers continue to be sold from stock, although in a lesser quantity, but an important factor has been noticed in the feather trade generally. It was prophesied that ostrich feathers would benefit under the new law, whereas the reverse has been the effect, and the American public seem to regard ostrich feathers, we are told, merely as any other feathers, viz., articles of commerce, only obtainable under cruelty, &c. In fact, the ostrich feather trade generally is now suffering from the general impressions created by the agitation against the feather trade. The Cape Prime Minister felt obliged to make a statement in the Cape Parliament concerning the humanity of gathering the ostrich feathers, and there is no doubt that the agitation is doing the ostrich trade no end of harm.

A Plantain Canker.

WE see by the Ceylon papers that a scarcity of plantains of every variety which recently existed in the island was attributed to a pest (a sort of canker) which has appeared within recent times. The bark as well as the young leaves is affected. The first visible sign of the presence of the canker is in the tender leaves, which, instead of spreading out in their usual soft yellow tint, shoot out crumpled and discoloured. The matter has not yet been investigated, but it is one well worth bringing to the notice of the experts at Peradeniya gardens. No official reports have been received at the Kachcheri. But all the trees on Attapattu Mudaliyar's estate at Kurunegalle have died. Several other wealthy landowners, &c., too, have complained of the same misfortune.



"Tropical Life" Friend.—No. 104.

PROF. EDWIN BINGHAM COPELAND, Ph.D.

Dean of the College of Agriculture, Los Baños, P.I.

Two years ago, when we were agitating vigorously and all "on our own" for agricultural colleges to be established in Ceylon and elsewhere, Prof. Copeland crossed quills with us for a misstatement which, at this belated period, we now amend and apologize for. "In your issue for March, 1912," our literary adversary wrote, "you published an article on 'The Need of a Tropical Agricultural College,' in which I find this statement quoted from the Trinidad press: 'At the present moment we believe that we are right in saying that there is no such institution as a tropical agricultural college in the world, pure and simple.' Unless," continued "Our Friend," "we are exempted by the qualification of simple, the College of Agriculture of the University of the Philippines should be recognized as exactly the kind of institution which is here meant, and which Trinidad is wise in seeking to have established."

The Philippine College of Agriculture is about 3 kms. east of the village of Los Baños, Province of Laguna, and occupies a tract of some 72 hectares (or roughly 180 acres) of land at the foot of Mount Maquiling in the island of Luzon, on which Manila is also situated. Los Baños is connected with Manila by rail or boat, so the journey to and fro is quite simple.

For those who, like ourselves, are anxiously awaiting to see such colleges established in the English Tropics,* we may add that at the Los Baños one the

* We must add here that the inhabitants of our Indian Empire are already well provided with agricultural colleges, although with the enormous numbers to be trained many more are required, thanks to the strenuous efforts being made by the Government and the excellent agricultural departments under them to raise the status of the agriculturists in India generally, and to improve their methods both of cultivating the ground and preparing their crops in every way possible.

land is described as being diversified, and permits the cultivation of every important crop produced in the Philippines.†

The College of Agriculture began its class work under Prof. Copeland as Dean and Professor of Economic Botany, and Mr. Murray Bartlett as President, on June 14th, 1909, but it was not until October 4th of that year that the completion of the necessary buildings made it possible for classes to meet on the college farm. It now runs a very creditable organ, or agricultural magazine, of its own, which we receive regularly and find most interesting.

Thanks to the kindness of Prof. Copeland, we can give the following particulars. The college gives two courses in agriculture—one of six years, admission to which is open to graduates of the intermediate public schools; the other of four years, leading to the degree of Bachelor of Science in Agriculture; candidates for admission to which must be graduates of a high school. For graduation from either course, the student must have four years of agronomy, each of which is considered as at least two hours of work daily. Before entering the second year of agronomy, the student must have had a year of practical plant physiology, based on a year of general botany. Besides botany and agronomy, all students must take a year of zoology, a year of economic entomology, at least one year of animal husbandry, one year of agricultural engineering, a year of physics, two years of chemistry, be able to read German, to be sufficiently at home with Spanish to be able to transact business easily in it. Under engineering is included irrigation, drainage, sanitation, agricultural machinery, road making and mending, and farm building erection. To show how the college was needed, we can state that in four years the number of students rose from 55 to 261, or an increase of over 400 per cent.

"There is one peculiarity of the curriculum," Mr. Copeland wrote us in 1912, "which, in the light of three years' experience, I recommend without qualification for adoption elsewhere; this is the arrangement of the work in agronomy by single crops. The different crops are taken up one at a time, and in connection with each the student is given instruction and experimental work on as much of its physiology as has direct agricultural value; as well as on the uses and value of the products."

Those who know Prof. Copeland's career feel that his training admirably suits him for the post he occupies to the benefit both of the Filipinos and of the American Government. Careful, conscientious and able, he has already done good work in the past, and that is but a fraction of what we look for from him and he means to give in the future.

We are almost glad of the mistake we made, or rather reproduced, in our issue for March, 1912, since "Our Friend," in correcting it, thought fit to give us much of the information published above. The Filipinos certainly needed a college, and are fortunate in securing it, especially with such a Dean. We hope that we shall be able to similarly congratulate our own island colonies in the Tropics before very long.

† Those knowing our West Indian island of Trinidad as we do realize the almost ideal conditions to be met with there when it is finally decided to establish a college for the West Indies in that island.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

FEBRUARY, 1914.

The Cultivation and Exploitation of Rubber in Brazil.

As if in answer to the report of the (London) Rubber Growers' Association, on which we commented last month, the Brazilian Government has published in Paris a French translation of the able and detailed report drawn up by our old friend, M. Labroy, in collaboration with M. V. Cayla, the agricultural engineer, at the request of Dr. Pedro de Toledo, the Minister of Agriculture for Brazil. Since the days M. Labroy took charge of *Le Journal d'Agriculture Tropicale*, after the death of its founder, Vilbouchevitch, when we used occasionally to contribute to its columns, he (M. Labroy) came across to the 1908 (London) Rubber Exhibition, and practically ever since then, we believe, has been engaged by the Brazilian Government to investigate and report on the rubber industry of the Amazon. News of him was but sparse, even M. Ferd. Main, who was in charge of *Le Journal d'Agriculture Tropicale* in his absence, often could give none, but we believe during this period M. Labroy acted as Director of the Rubber Experimental Station at Pará, that is, when he was not away on his mission up the Amazon. Unable, of course, with the time at his disposal, to penetrate as far up north or towards the montaña of Peru, as he would have wished, M. Labroy seems to have concentrated his attention to the lower and middle zones of the Amazon, especially at the mouth of the Xingu River, to certain portions of the State of Bahia, and along the Rio São Francisco.

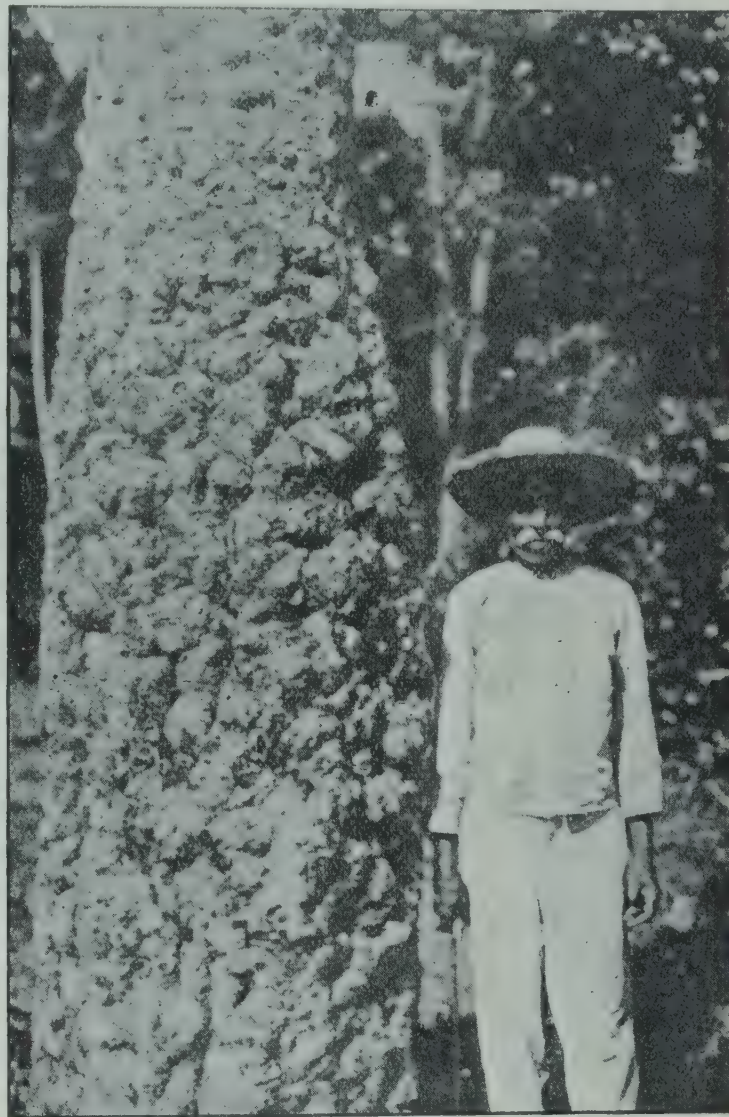
As a result of his labours we have (in French) a careful report on the Hevea, Castilloa and Manihot trees indigenous to Brazil, and many of our readers

will be astonished at the number of varieties of each that are met with and discussed.

The report, with its 105 illustrations, covers 220 pages, and is divided into five parts: (1) Generalities; (2) Hevea Brasiliensis, wild and cultivated, together with over 30 pages on the treatment and preparation of the latex; (3) the Manicoba (Manihot) rubbers; (4) Castilloa; (5) Mangebeira.

References we have made a note against include the following:—

Page 22.—We have seen that, in the vast Amazon valley, the home of the Hevea, there are excellent possibilities of laying out rubber plantations, the



Taken from fig. 7 of M. Labroy's Report.

Base of the trunk of a *Hevea sylvestre*, showing the excrescences and general warty appearance of the bark, caused by the repeated use of the machadinho over a period of years.

climate and soil, most important factors for assuring success, being particularly suitable.

M. Labroy is against giving up the machadinho, or little tapping hatchet of the seringueiro. All that is necessary," he maintains, on p. 42, "is to supervise the tapping a little and see that it is carried out so as not to harm the trees." As such supervision would be even more necessary with the tapping tools of the East, such a suggestion is not out of the way; at the same time, as more scientific methods find their way into the Brazilian seringals, tapping instruments of the farrier-knife type are certain to be found there, especially as many illustrations in the latter part of

the report show such implements to be already used up the São Francisco River (see fig. 80) for tapping.

We agree with the contentions of those who maintain that it has yet to be proved that the excision methods of the East are better in the long run to the trees and to the yield than the incision methods of the machadinho of the West; harmful as the latter can prove when unskilfully used, as the above photograph we reproduce from the report clearly shows, yet, taking all the circumstances into consideration, the machadinho has many advantages.

Roughly speaking, the seringueiros are busiest between July and February, and after making allowances for illness, fêtes, &c., the average number of days throughout the year on which the trees are tapped ranges between 100 and 140 (p. 46). This leads us to the important question of yields. On the average an *estrada* has 135 trees, we believe (p. 39 says 80 to 170), and whilst a virgin *estrada* in the Upper Xingu has given 1,000 kilos of dried rubber, others average 200 to 300 kilos annually. This, we take it, is before the rubber has been left to drain and dry after the smoke curing, when, we are told, on p. 51, between the time of the smoking and the sale at the port of shipment as much as, and generally near to 50 per cent. of the original weight is lost.

The daily output of an average tree has been put at 22 gr. *borracha fina*; allowing that there are 140 days' tapping, 22 by 140 should give 3,080 gr. as the average yield per tree in a year, or, it is estimated, an average of 400 kilos per *estrada*. Of the output for 1912-13, it is estimated that the proportions of the three qualities work out thus:—

Fina	...	...	...	...	63	per cent.
Entrefina	...	...	...	...	10	"
Sernamby (<i>i.e.</i> , scrap, dirty, &c.)	...	...	...	...	27	"

Want of space compels us to cry halt, but we do so with reluctance. We congratulate MM. Labroy and Cayla on the report, the result of several years of strenuous work, and feel sure that Brazil will benefit by its appearance.

The Cry for Cableways in the East.

SINCE we published articles on the increasing demand for cableways in the Tropics (see April last, p. 65, and May, p. 94) things have not stood still as regards proofs of how seriously commerce and agriculture can be handicapped in the Tropics through lack of the necessary transport facilities, and Ceylon has again been to the front as regards determination to overcome the trouble. At the general meeting of the Knuckles Planting Association, held on December 4th in that island, the discussion shows that whilst motor transport was not impossible, aerial transport would be much cheaper, and, according to the *Ceylon Observer*, the sub-committee appointed by the District Planters' Association, after thoroughly investigating the question and different methods of transport, came to the conclusion that, of all methods, the one of aerial transport would be the one that would prove most suitable for this district if it could be carried out, as we imagine it can be.

The reasons for the decision are given as follows:—

"(1) Carting transport has been shown to be inadequate for the needs of the district as well as being exceedingly slow.

"(2) Owing to the steep gradient of the roads and the heavy work this entails, especially in the wet weather, it has been found impossible to get new carting contractors to come to the district to take up carting.

"(3) Motor transport would seem to be out of the question as, under the present Government specifications for this road, a gross weight of only 2½ tons is allowed, and this appears to my Committee to be all that the present road is capable of standing. The cost of making the road suitable for heavier lorries is apparently prohibitive: added to this, increased upkeep expenses would be incurred.

"(4) Aerial ropeways would afford a much quicker means of transport, besides which a large saving in road upkeep might be expected.

"In order to find out the best trace and to ascertain whether aerial transport is feasible it will be necessary to have a survey made of the route, and my Committee request me to ask if Government will be prepared to help them in this matter by giving them the services of a competent surveyor to undertake the work."

Elsewhere, we are told, the Maha-Oya Bridge ropeway already in use can be worked with loads of one hundred-weight at intervals of thirty seconds; this shows the capacity of that line.

Turning to the *Times of Ceylon*, we see that at the general meeting of the Uda-Pussellawa Planters' Association (Ceylon) a full description of the aerial ropeway belonging to and worked by the Kanan Devan Hill Produce Company, Ltd., was laid before the members. From this we learn that the cost of the ropeway, including driving machinery and erecting, was approximately £10,000 (Rs. 150,000), and that it is thoroughly efficient.

"This ropeway is used by the Kanan Devan Hill Produce Company, Ltd., as their means of transport for goods to and from the top station. The ropeway is divided into two sections. The bottom section consists of one and a half miles double rope, the top section one mile double rope. The origin of power to drive the rope is from water. Two water turbines are coupled direct to two 30-k.w. direct current dynamos; these latter machines generate current at 540 to 550 volts, and this current is transmitted to the central station, which connects the two sections of the ropeway. The installation at the central station consists of two 40 h.p.d.c. motors, which are coupled to a bevel drive through belts, thence to a parallel pinion drive through vertical shafts; in this latter drive one small parallel pinion drives two large spur wheels. These spur wheels are fitted with iron wood blocks, and by their means the rope is driven. Jockey pulleys are used as a guide to the rope. The rope is supported by standards placed in suitable positions according to ground circumstances and gradient. Each section of the rope simply forms a loop, and all pulleys which it (the rope) touches are slip pulleys, excepting the driving spur wheels, which are, of course, fixed to their shafts. In connection with the general working of the ropeway: the total length is two and a half miles double rope, and the rise is practically 4,000 feet (3,932 ft.). The rope travels at a fraction over two and a half miles an hour, or 220 ft. per minute. It will therefore be noted that the rope runs at a gradient of 1 in 3.5, but this cannot be calculated owing to the sag in ropes between the standards. The gradient is different at every part. The actual cost of running the rope, without

allowing anything for depreciation of any kind, is Rs. 5 per ton, *i.e.*, Rs. 2 per ton mile. This figure is, of course, of very little interest, but it allows for a staff of an assistant engineer, one foreman and assistant, two writers at top station, two writers at bottom station, and a staff of fifty including fitters (fitters of a half-trained type it is worth noting). This ropeway can transport with comfort 300 loads (each 200 lb.) up and down the rope daily. Allowing Rs. 1,700 for expenses of staff, Rs. 862 depreciation in the system per month, then Rs. 7 per ton should clear all expenses in running an aerial installation similar to this. Rs. 7 per ton works out at Rs. 2.13 per ton mile. Our present charge on the ropeway is Rs. 7.8 per ton, or Rs. 3 per ton mile. Any extra unforeseen expenses which may be entailed in a system of this kind are covered by the special ropeway charges, such as bulky packages R. 1.8 each, and double loads with extra long articles, which require two hangers, double the price, Rs. 15 per ton, or Rs. 6 per ton mile. The life of the rope varies from one and a half to three years; a good average is two years. Every two years, therefore, the following expenses are necessary:—

	Rs.	cts.
To four coils best plough-steel 7/8 per diem six-strand seven-wire rope	8,169	00
Transport for above	1,464	00
12 w.i. (wrought iron) hangers (per year)	144	14
New jaws and guide plates for grips (per year)	750	00
Thirty new pulleys per year	600	00
Perquisites	150	00

The above are all included in my allowance of Rs. 862 per month for depreciation, and, therefore, if Rs. 3 per ton mile is a fixed rate on a system similar to this, there should be no difficulty in clearing all expenses and having a small profit. When necessary the ropeway can transport 370 loads per day up and down the rope. The better the balance of loads on the rope the longer the life.—(Sgd.) C. L. DOBBIE, Assistant Engineer in charge of Ropeway.

Frog-hoppers and their Remedies.

WHAT IS BEING DONE IN TRINIDAD, B.W.I.

SUGAR-CANE planters, and others to whom the frog-hopper (genus *Tomaspis* as *T. varia*, *T. pubescens*, *T. carmodyi*, *Tomaspis* sp.) is no friend, would, we should imagine, hasten to devour a recent bulletin of the *Trinidad Department of Agriculture* dealing with them. The nymphs of this pest delight to feed upon the sap of the rootlets of the sugar-cane, and do so to such an extent that the leaves wither and fall, and the canes, although not killed, are badly checked, and only make a fair growth after the "fly" or "hopper" disappears. As canes are grown to produce sugar and not feed pests, the loss caused by this "checking" certainly amounts to 10 per cent. of the total output, and possibly more. As this 10 per cent. must of necessity come out of the net profit, sugar, even at its recent and present prices, cannot pay such dividends as it ought to, and could do, if free of the pest.

To reduce this loss—for at present so far as Trinidad is concerned there seems but little chance without a more united and vigorous action being taken of ever exterminating it—various proposals are made.

First, according to Mr. J. C. Kershaw, the Government Entomologist, we are told that the froghopper

is probably indigenous to Trinidad for the following reasons:—

(1) There are at least four species of the genus in the island.

(2) It prefers native grasses as food plants to the sugar-cane.

(3) It has at least two egg-parasites, and the nymphs are killed off to some extent by the larvæ of the native hover-fly (*syrphidæ*).

(4) There are very commonly one or two large parasitic worms in the abdominal cavity among the viscera of the adult froghopper, and these worms also occur in other Homoptera here. Records, however, show that the pest is not, alas! only confined to Trinidad, but has been met with in British Guiana, British Honduras, Panama, Cuba, Mexico, &c.

Various remedies, parasites, &c., are discussed, among others being the use of nitrolim as a fertilizer to be applied to the ground, and of lysol and kerosene as a fluid ejected on to or into the affected leaf sheath.

Mr. Kershaw has certainly put his case very clearly. "Young plant-cane," he tells us, "is naturally least fitted to withstand the constant drain of sap from the rootlets caused by the feeding thereon of the nymphs of the froghopper. If at this period the growth of the cane could be hastened by the application of a fertilizer, the plants would, I believe, hold their own till grown too large for the nymphs to have any serious effect on them. Since nitrolim has been proved a valuable and fairly cheap fertilizer, and moreover, is at least of some use in killing the nymphs when it comes in contact with their spume (causing their drying up), it seems desirable to give this compound an extended trial as a fertilizer for newly planted cane.

"There are thus three artificial methods of holding the pest in check, apart from the possibility of a natural one in the shape of the Green-Musccardine fungus, which promises some measure of success, and is therefore being tried on a large scale in one section in Trinidad (at Chaguanas):—

"(1) The use of nitrolim as a manure primarily, and secondarily against the attack of the froghopper nymphs. This can be applied to the roots of the canes by the usual dusters.

"(2) Kerosene-lysol emulsion against the adult hopper. This is very effective if properly applied. If the insect is touched at all by the liquid it is killed in a few minutes. In the Chaguanas experiments the liquid was applied from an ordinary whisky bottle (27 oz. bottle) fitted with a cork, through which passes a short piece of glass tube, $\frac{1}{4}$ in. bore, so that it emits a jet, not a spray. A little of the emulsion is shaken into the leaf-sheaths where the insects are hiding. Kerosene and water is even more effective, but unless continually shaken up will separate almost immediately, whilst the emulsion remains emulsified indefinitely. Professor Carmody (Director of Agriculture, Trinidad, W.I.) gives the following proportions for mixing the emulsion:—

Lysol	3 oz.
Kerosene	9 "
Soft water*	4 galls.

the lysol and kerosene to be mixed in the measure and then stirred up in the water, thereby giving a

* Equal to an American kerosene, or pitch-oil, tinful.

2 per cent. emulsion. To be effective, the emulsion must be used before the canes are more than breast high.

“(3) After each brood of adult froghoppers, the old leaves on the growing canes should be examined for eggs. If these are found in any number the canes should be trashed (*i.e.*, stripped of their leaves), and the trash taken at once to the cattle sheds and used as litter, when the eggs will soon be destroyed.”*

Meanwhile spiders, carnivorous grasshoppers, bugs, a tickbird (*Crotophaga ani*), the Trichogrammid (“Vermilion”) egg parasite, exposure to the heat of the sun, or a low temperature, feed upon or otherwise kill off the pest, whilst dampness encourages it. As 37 pages are devoted to describing the pest and giving an account of its life-history (illustrated with excellent plates), those whose business it is to rid themselves of this nuisance, as well as others who make fluids and apparatus to help keep the insects under, cannot do better than study the important data contained in this bulletin.

Marseilles and Vegetable Oils.

In the section devoted to Marseilles of Mr. Consul-General Gurney's report on France, we gather the following items of news:†

Of the annual value of the total output (£52,120,000) of the principal industries of Marseilles, vegetable oils, raw and manufactured, can be said to account for £17,000,000: say oils and oil-cakes, £14,000,000, and soap-making, £3,000,000, to say nothing of candles and wax, £875,000, and lard, &c., £1,600,000, into which vegetable oil substitutes may or may not enter.

Last year, 1912, was a comparatively poor one in the oil trade (the chief industry of Marseilles, as can be seen by the above) owing to the high prices of the raw material. This being so, we wonder what the report for 1913 will say when it is published. The Ministerial crisis and the strained international situation during the summer and autumn also had a depressing effect. The total number of oil factories in Marseilles is 45, containing 1,941 presses, with a capacity of 1,000 tons a day. The principal factories specialize, either in crushing seeds, dealing chiefly with copra and coco-nut oil, or with cotton-seed and ground-nut oils, edible cotton-seed oils, and deodorized oils. Only one firm crushes linseed, imported from Bombay, for the production of edible oils. This is consumed in certain parts of France as a substitute for walnut oil. About 225,000 tons of ground-nuts were imported, from which 50,000 tons of oil were produced, being equal to $4\frac{1}{2}$ tons of nuts to one ton of oil. Imports of copra amounted to 175,000 tons, from which some 100,000 tons of oils are returned as being produced, or 1 ton of oil to each $1\frac{3}{4}$ tons of copra, which must have contained, therefore, nearly 60 per cent. of oil.

It is estimated that some 30 per cent, or 30,000 tons, of the coco-nut oil is used for edible purposes, *i.e.*, to make coco-nut butter, whilst the 70 per cent. goes for soap-making. The chief feature of interest during 1912 was the large increase and development of the new process for neutralizing and deodorizing the ordinary quality of ground-nut oil, previously only considered suitable for soap-making, and utilized for that purpose. By this process, however, the oils are made perfectly sweet, and they are largely bought for edible purposes. It is estimated that nearly one-third of the production of oil from the Madras crop of ordinary decorticated ground-nut kernels has been thus converted into edible oils. Owing to this and the high price of oil the olive oil industry has been passing through a severe crisis. The deodorizing is, we are told, also beginning to be applied to olive oil.

Arrangements are being made to organize a Colonial Exhibition at Marseilles in 1916, on a much larger scale than that of 1908, which proved so successful in every way. The extensive exhibition ground of 1908, now a public park, will be used. Our old friend, M. Emile Baillaud, with whom we came in contact when working together on *Le Journal d'Agriculture Tropicale*, is now Secretary to the Institut Colonial de Marseille, and a prominent figure in tropical circles of that flourishing port. He has very kindly been helping us to advise a friend in Australia how to start in the edible butter manufacturing trade, and were more firms making the necessary apparatus to advertise and help us as he has done a considerable amount of business could be secured. The Institut Colonial has, by the way, recently published an important book, entitled “*La Production des Possessions Françaises pour 1911 et 1912*,” which those interested in vegetable oils (and other products) will find extremely useful. Why this is so, we hope to show by means of quotations in a future issue.

AN idea of the cost of subsoiling with explosives, the *Wealth of India* tells its readers, is given by Mr. H. C. Coggins, in the *Agricultural Gazette of New South Wales*, who gives his testimony also to the use of explosives for the various purposes already mentioned by Mr. Treleaven:—

TABLE SHOWING COST OF SUBSOILING WITH EXPLOSIVES.

Distance of holes apart	Charge	Number of holes per acre	Number of lb. per acre.	Number of feet of fuse per acre in 3 ft. holes	Number of detonators per acre	Total Cost per acre		
Feet	Plug					£	s.	d.
10	$\frac{1}{2}$	435	21 $\frac{3}{4}$	1,305	435	2	12	9
10	1	435	43 $\frac{1}{2}$	1,305	435	3	14	6
12	$\frac{1}{2}$	302	15	906	302	1	16	6
12	1	302	30	906	302	2	11	6
15	$\frac{1}{2}$	194	10	582	194	1	3	10
15	1	194	20	582	194	1	13	11
18	$\frac{1}{2}$	128	6 $\frac{1}{4}$	384	128	0	15	4
18	1	128	12 $\frac{1}{2}$	384	128	1	0	7
20	$\frac{1}{2}$	109	5	327	109	0	12	9
20	1	109	10 $\frac{1}{4}$	327	109	0	18	0

* If there is a bare field handy, large enough to avoid any chance of the canes catching fire, we should suggest making a bonfire of the trash, burning it as brought in. What is best and safest to do, however, must be decided by the experts on the spot.

† These notes are founded on Mr. Consul-General Gurney's report on France, section Marseilles, No. 5,174. Price 2 $\frac{1}{2}$ d., postage 1d. extra. Wyman and Sons, Ltd., Fetter Lane, London, E.C.

Notices of Books.

MAIZE—ITS HISTORY, CULTIVATION, HANDLING AND USES. By Joseph Burt-Davy, F.L.S., Government Agrostologist and Botanist, Union of South Africa. 831 pp., with Frontispiece (Portrait of General Louis Botha, P.C., Prime Minister and Minister for Agriculture, South Africa) and 245 illustrations. Price 25s. net, or 26s. 6d. post free. Longmans, Green and Co., 39, Paternoster Row, London, and at New York, Bombay, and Calcutta. A review of this important work will appear in a subsequent issue.

COCO-NUT CULTIVATION, with some Notes on Plantation machinery. By H. Lake Coghlan and J. W. Hinchly. 128 pp., including index, 10 full-page illustrations and various diagrams. Price 3s. 6d. net. London: Crosby Lockwood and Son, 7, Stationers' Hall Court, E.C., and 5, Broadway, S.W.

Those needing a small handbook on coco-nut cultivation will find the above most useful.

EVAPORATION IN THE CANE AND SUGAR-BEET FACTORY. By Edward Koppeschaar, formerly Technical Manager of the Viervervaten Sugar Factory, Holland. 116 pp. Nine plates, including four photographs of old sugar refineries. Price 7s. 6d. net. Norman Rodgers, St. Dunstan's Hill, London, E.C.

A practical and somewhat simpler discussion of the subject, based on practical experience as well as on the treatises of the leading authorities on the question of evaporation and sugar-making.

RUBBER: ITS SOURCES, CULTIVATION AND PREPARATION. By Harold Brown, of the Imperial Institute, with a preface by Prof. Wyndham Dunstan, C.M.G., &c. 245 pp., with 3 diagrams and 12 plates. Price 6s., or 6s. 6d. post free. Imperial Institute series of Handbooks to the Commercial Resources of the Tropics. London: John Murray, Albemarle Street, W.

A useful detailed account of the present position of the rubber producing industry, with particular reference to West Africa. Read in conjunction with Christy's "African Rubber Industry,"* those interested in the present critical stage of the African rubber industry will find Mr. Harold Brown's book extremely useful.

THE eleventh edition of the *Financier* Rubber Share Handbook has made its appearance at a time when the particulars it gives of the 611 companies discussed are of special interest, whether the estates are in Ceylon, South India, Burma, Sumatra, F.M. Straits, Java, Borneo, Africa, or Latin America. Mr. E. L. Killick contributes an excellent Preface, and, as usual, the book concludes with an alphabetical list of all the directors, and also of the firms and individuals acting as secretaries to a group of companies. Packed ready for postage the book scales under 1 $\frac{3}{4}$ lb., and costs, exclusive of postage, the modest sum of 2s. 6d net, at the office of the *Financier*, 49-57, Wool Exchange, London, E.C.

AMONG the reports on recent investigations at the Imperial Institute, published in the current issue of their *Bulletin* (an exceptionally good number), the results are given of valuable laboratory tests of some new and little known oil seeds and oils, which, in view of the high prices ruling for most of the fixed oils and fats of commerce, might be utilized to supplement the supply of standard commodities.

The other reports are on the utilisation of Pará rubber seed (Part II.), ground nuts, Baobab fruits and seeds, and tobaccos from British East Africa, and a report on cotton growing in the Gold Coast. Mr. P. H. Lamb, Director of Agriculture in Northern Nigeria, contributes a special article on agriculture in Hausaland, in which the reputed natural fertility of the Hausa plains is shown to be subject to qualification, from the point of view of agriculture. A special article on the Canadian Department of Agriculture, by Mr. J. H. Grisdale, Director of the Dominion Experimental Farms, supplies a comprehensive account of the organization of the experimental farms scattered throughout the Dominion, under the central farm at Ottawa; and some remarkable instances are given of recent and successful experiments in wheat-breeding. The hardening of liquid oils by a process of reduction known as hydrogenation, for the purpose of obtaining solid fats, is dealt with in a notice calling attention to this method of conversion, which is bringing about important developments in the oil and allied industries. Other general notices deal with the cultivation and preparation of rice (Part II), and cotton cultivation in Northern Nigeria.

"ROOT BORERS AND OTHER GRUBS" is a handy little booklet of 38 pp., including twelve covered with illustrations of the various pests. It is published as Pamphlet No. 73 by the Imperial Department of Agriculture at Barbados, and has been compiled by Mr. H. A. Ballou, M.Sc., entomologist to the department. Those beetle which attack the underground portions of the sugar-cane are mainly discussed; these include the *Rhynchophoræ*, as the *Diaprepes abbreviatus*, the *Exophthalmus esuriens*, the *Scarabæidæ* or "chafer" tribe; whilst further on (p. 21) we see the *Strategus titanus* spoken of as the rhinoceros beetle of St. Croix and Jamaica. Illustrations of the various stages of growth are given with each of the important pests.

MESSRS. T. B. BROWNE, LTD., have sent us a copy of their well-known "Advertiser's A.B.C.," price 10s. 6d., postage (net weight 6 $\frac{1}{2}$ lb.) extra. In this we note is an article by Mr. L. G. Chiozza-Money, M.P., dealing in a broad and comprehensive manner with the future of British trade, in which Mr. Chiozza-Money presents a point of view that may be assimilated without regard to political opinion, and his facts, as usual, are worthy of the most careful study. We note the various classified lists, occupying together no less than 754 pages, have been brought thoroughly up to date, and will be found more than ever valuable to advertisers on account of the ample information given as to advertising rates, &c.; whilst those who, like ourselves, need the foreign newspapers, will find a carefully compiled and exhaustive list of these under the various headings or sections to which they belong geographically.

* John Bale, Sons, and Danielsson, Ltd. 13s. 6d. post free.

Cotton.

THE following were the prices for Cotton in London on February 5th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1913.		Compare Good, 1912.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds *	5 $\frac{1}{2}$	to 5 $\frac{5}{8}$	5 $\frac{1}{2}$	to 6 $\frac{3}{16}$	5 $\frac{1}{2}$	to 6 $\frac{1}{2}$	—	6 $\frac{1}{8}$	to 6 $\frac{5}{16}$	5 $\frac{3}{16}$	to 5 $\frac{3}{8}$	—
Madras	6 $\frac{1}{8}$	to 6 $\frac{1}{4}$	5 $\frac{1}{2}$	to 6 $\frac{1}{2}$	—	—	—	5 $\frac{3}{4}$	to 6 $\frac{5}{8}$	5 $\frac{1}{8}$	to 5 $\frac{5}{8}$	—
Bengal	—	—	—	—	5 $\frac{1}{4}$	—	5 $\frac{3}{8}$	5 $\frac{5}{8}$	—	4 $\frac{1}{8}$	—	—
Assam	—	—	—	—	5 $\frac{1}{8}$	—	6 $\frac{1}{16}$	5 $\frac{7}{8}$	—	5 $\frac{1}{4}$	—	—
China	—	—	—	—	5 $\frac{1}{8}$	—	6 $\frac{1}{8}$	6	—	5 $\frac{1}{4}$	—	—
West Indian	7	—	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{4}$	7 $\frac{3}{4}$	—	7 $\frac{1}{4}$	—	—
Sea Island	11	—	14	—	17	—	20	15	—	13	—	—
West African	6 $\frac{9}{16}$	—	6 $\frac{1}{16}$	—	7 $\frac{3}{16}$	—	—	6 $\frac{5}{8}$	—	5 $\frac{1}{16}$	—	—
East	6 $\frac{1}{16}$	—	7 $\frac{3}{4}$	—	9 $\frac{1}{2}$	—	—	7 $\frac{1}{16}$	—	6 $\frac{3}{4}$	—	—

* Liverpool quotations.

Owing to a continuance of heavy receipts at the American ports, "Futures" have shown further weakness, and quotations, as compared with last Thursday's close, are about 8 points lower for near but only 2 to 3 for distant. On the spot there has been a good demand at times, but middling is reduced 6 points to 7.05d. Prices of East Indian shipments have been put down considerably, but buyers have not responded to any extent and the sales are still small.

The import into Liverpool this week amounts to 95,498 bales, since September 1st 2,757,134, same week last year 123,779, last year's total 3,230,486 bales. The estimated Sales amount to 57,000 bales, including "called." Middling American is quoted at 7.05d. per lb., last year 6.89d., 1912 5.85d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight	11,513,000	10,926,000	11,475,000	bales
Exports from United States since September 1st—				
To Great Britain	2,328,000	2,765,000	2,785,000	—
To Continent, &c.	3,532,000	3,293,000	3,681,000	—
Total crop	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	February 7th.	Same time 1913.	Same time 1912.	
February	6.64 $\frac{1}{2}$	6.65 $\frac{1}{2}$	5.60 $\frac{1}{2}$	per lb.
Feb.—Mar.	6.64	6.63 $\frac{1}{2}$	5.60	—
Mar.—April	6.66	6.63 $\frac{1}{2}$	5.61	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

SINCE the beginning of February there has been a generally good demand for most descriptions, and late rates have been fully maintained for medium sorts, whilst fine kinds were rather dearer. Of the New Crop of East India offered, Neilgherry sold readily at full prices, but Coorg and Wynaad were slow, though the prices realized must be considered as quite satisfactory as the quality left much to be desired. Costa Rica was in good request, and Unwashed Dumont Santos sold well. Mexican and Colombian were steady, but East African kinds closed rather in buyers' favour. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on February 1st show an increase for the month of 418,000 bags, against an increase of 476,000 bags at the same time last year; the visible supplies show a decrease for the month of 389,000 bags, against a decrease of 747,000 bags in 1913. The market for "futures" has been quiet and generally easier, the latest price of May Santos showing a decline of 9d. for the week. We quote :—

	To-day	Jan. 29th, 1914
London ... Santos, May del.	45s. 6d.	46s. 3d.
New York ... No. 7, Rio	9.40 cents	9.54 cents
Hamburg ... Santos	51 $\frac{1}{4}$ pf.	51 $\frac{3}{4}$ pf.
Havre ... Santos	63 francs	63 $\frac{1}{4}$ francs

The receipts at Rio and Santos from July 1st, 1913, to February 4th, 1914 were 11,498,000 bags, against

10,603,000 bags and 10,375,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India (new crop).—Neilgherry, 75s. for smalls, 86s. 6d. for second size, 90s. for bold. Coorg, 78s. to 80s. for second size, 86s. to 88s. 6d. for bold. Wynaad, 82s. for second size, 84s. 6d. to 85s. 6d. for bold.

Ceylon.—At 70s. 6d. for bold brownish Liberian.

Mocha.—At 82s. to 82s. 6d. for longberry greenish.

Nairobi.—At 85s. 6d. for bold.

Nyasaland.—At 58s. for smalls, 69s. for medium, 76s. for bold.

Marangu.—At 63s. 6d. to 68s. 6d. for medium, 82s. to 83s. for bold.

Uganda.—At 51s. to 62s. for smalls, 60s. to 69s. 6d. for medium, 76s. to 79s. for bold.

Bukoba.—At 45s. for small brown.

Jamaica.—At 58s. 6d. to 65s. 6d. for fine to fine fine ordinary, 73s. to 76s. for low middling, 77s. to 82s. for bold.

Costa Rica.—At 62s. to 76s. for fair to fine smalls, 71s. 6d. to 85s. for fine ordinary to good middling, 81s. to 92s. 6d. for middling to fine bold.

Vera Paz.—At 81s. 6d. per cwt.

Mexican.—At 61s. to 69s. 6d. for smalls, 74s. 6d. to 75s. 6d. for good middling, 78s. to 84s. for bold.

Colombian, &c.—At 68s. 6d. to 77s. 6d. for low middling to good middling, 79s. to 83s. for bold.

Dumont Santos.—Unwashed at 44s. to 49s. for smalls, 56s. to 59s. for medium, 60s. 6d. to 64s. for bold.

Sugar.

THE tendency for some days has been quieter, report Messrs. Czarnikow, Ltd., mostly on Continental offers of next crop sugar from 9s. 7½d. to 9s. 7d., under which offers August gave way from 9s. 8½d. to 9s. 7½d., and May from 9s. 6d. to 9s. 4½d., but on firmer New York reports, based on rain in Cuba and rumours of less favourable crop anticipations, there was a recovery to 9s. 6½d. closing at 9s. 6½d. sellers, so that on balance the market has improved. In the almost total absence of trade demand, which has continued for over a month owing to stocks accumulated here, this shows that our level of prices inspires no uneasiness. The American market on Monday had moved from 3·48 to 3·42 cents for Cubas, whilst Porto Ricos sold down to 3·33 cents, and for March arrival at 3·12½ cents, which latter price will be equal to 9s. 9d. c.i.f. New York for Cubas, but yesterday New York again paid for February 3·48 cents. The reduction in U.S. duties on March 1st will not only make sugar cheaper to American consumers, but it raises the comparative value of non-preferential sugar. By this Javas will pay 1s more duty than Cubas till 1916, which fixes their relative value in U.S., but the equivalent of 88 per cent. Beet is more or less vague. Anyhow, non-preferential Centrifugals at 8s. 9d. c.i.f. New York can, after March 1st, compete at 3·125 cents, whilst at present that duty-paid price is the equivalent of 6s. 8d. c.i.f. for foreign 96 per cent.

Copious rains are reported from Cuba, doing much good to the growing canes, both for this and next crop, but just now interfering with grinding. To this latter circumstance and smaller Cuban receipts may be attributed the recovery in prices. If rain had not come there would have been complaints, if it stays longer than necessary there will be complaints, and in Cuba it seems quite as difficult as here to content everybody. The planters are evidently not satisfied with Himely's, nor even Guma's estimate; there is a talk of appointing Government experts in each province to report on crops, and one of its agents has started by giving as his opinion that the crop is over estimated by a trifle of half a million tons. That man has no previous record, and may regret next year his present statement, whilst Guma and Himely last year were very near, but still below final results.

The German factories held on January 31st 441,000 against 402,650 tons, but we are mostly interested in the total German stocks which will be published in ten days. It is said that more sugar than last year declared for export is detained in transit. In that case the combined figure of sugar in transit and shipped abroad will be no real comparison for our foreign exports alone. Frost was again reported from Bohemia, but Magdeburg hopes soon to reopen navigation.

The American market has been active throughout the week, and though at one time there was a decline of ·06 cent, the spot quotation for 96 per cent. Centrifugals has recovered to last week's level of 3·48 cents = 9s. 9d. c.i.f. New York. In Cuba there are 163 factories at work against 164 last year.

In the United Kingdom business in refining grades of cane sugar has been on a limited scale owing to the small supplies available. Grocery Crystallized continues slow of sale at previous rates. As regards

cane-producing countries, advices to hand by mail report that the crop in Australia will reach 250,000 tons, and possibly exceed that figure, splendid rains having fallen during the last two weeks of December. In Fiji prospects are exceptionally favourable, and should no damage be done by hurricanes during the next two months, a yield of 100,000 tons is expected.

The total transactions for the week amount to about 4,000 bags of British West India, including Crystallized Demerara, good middling pale at 14s. 1½d. to 14s. 3d. duty paid, good middling yellow 14s. 3d. to 14s. 7½d., good yellow and bright ditto 14s. 9d. to 15s. 3d., fine yellow and pale to choice pale 15s. 6d. to 16s. 9d.; whilst low brown Syrups sold at 9s. 10½d., low middling yellow 11s. 1½d., middling soft yellow 11s. 6d. to 12s., good yellow 13s.

Some Mauritius White Crystals soon due sold at 11s. 5½d. to 11s. 6d. c.i.f. London, and Surinam Crystallized, low grey to middling greyish yellow, has changed hands at 13s. 3d. to 13s. 9d. duty paid.

In Liverpool about 450 tons Peruvian grainy soon due have been sold at 10s. 3d., basis 96 per cent., and 80 tons Syrups at 8s. 9d., basis 89 per cent., Liverpool, quay terms, and 80 tons Syrups at 8s. 6d. floating, landing, Clyde, basis 89 per cent.

The India-rubber Market.

ACCORDING to the *Board of Trade Journal* the Straits Settlements exported 11,889 tons of rubber last year, against 5,799 tons in 1912. These figures include transshipment of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, the Non-Federated Malay States, &c., as well as rubber of domestic production, but are exclusive of the Federated Malay States, which exported 23,463 tons last year, against 15,505 tons in 1912. Add to this 11,835 tons exported by Ceylon, against 6,321 tons in 1912, and we arrive at the following total exports from the East:—

	1913	1912
Federated Malay States	23,463	15,505 tons
Straits Settlements	11,889	5,799 "
Ceylon	11,835	6,321 "
Total	47,187	27,625 "
Against Brazil's, &c., output	39,370	42,410 "

Against the above the estimates for the 1914 output are mostly in favour of 60,000 to 65,000 tons of rubber as being the probable exports from the East.

As regards prices and movements the Pará market up at Liverpool has been firm during the week, but closes ½d. per lb. down from the top. Values run: Hard fine spot end February 3s. 2½d., March-April and April-May 3s. 2d., soft fine February-March 2s. 11½d., Peruvian ball 2s., and scrappy negroheads 1s. 11d. per lb. Medium Brazilian grades are steady, and the sales include Ceará scrap for forward delivery at 1s. 4d., Assare scrap on spot at 10d. to 1s., and Manicoba at 1s. 4d. per lb. The African market has been firm, and the sales reported amount to 35 tons, including Conakry sheets and strings 1s. 11½d. to 2s., Conakry niggers 1s. 11½d., Hausa cake 1s. 8½d. to 1s. 9d., Lagos lump (tel quel) 1s. 2d., selected gold and/or Ivory Coast lump 1s. 2d., ditto rejections 1s. 1d., Assinee paste 9½d., Accra paste 9d., and Benin lump 1s. 3½d. per lb.

In London, the *Public Ledger* tells us, plantation rubber has been very firm, and a large business has been done, which includes a fair quantity of first hand selling, at prices which show a good advance on last week, closing, however, below the best. Standard No. 1 Crêpe on the spot and February delivery sold at 2s. 6½d. to 2s. 7d., closing 2s. 6½d. value, February-March up to 2s. 7d. down to 2s. 6½d. value, and April-June at 2s. 6d. to 2s. 6¼d. to 2s. 6d. and value, and July-December at 2s. 5¾d. to 2s. 6½d., closing 2s. 5¾d. value. Smoked sheet (ribbed) has been dealt in only to a limited extent; spot and near sold at 2s. 6½d. to 2s. 7¼d., closing 2s. 7d. value, and February-June at 2s. 7d. to 2s. 7¼d., now 2s. 6½d. value.

At the public Sales on February 10 to 11, whilst Standard Crêpe was quoted at 2s. 7d., Hard Fine Pará 3s. 2½d., Soft Fine 2s. 11½d., and Caucho Ball 2s. 0¼d., other kinds, according to Messrs. S. Figgis and Co.'s report, realized the following prices:—

Plantation Malaya (894 tons sold).—Crêpe, fair to fine pale, dull to good palish (1 lot 2s. 7½d.), 2s. 6¾d. to 2s. 7¼d.; light brown and grey, part streaky, 2s. 5¾d. to 2s. 6¾d.; fair to good clean brown, 2s. 4½d. to 2s. 6¼d.; dark and specky brown, 2s. 3d. to 2s. 5¼d.; dark and black, part pressed, 2s. 2½d. to 2s. 5d.; dark and black inferior, 1s. 10½d. to 2s. 2d.; dark to good smoked, 2s. 4¾d. to 2s. 6½d.; cured by "Byrne" process, dark to good (Sheet 2s. 7¼d.), 2s. 4d. to 2s. 7½d. Sheets, fair to very fine smoked (Highland, 2s. 8¾d. to 2s. 9d.), 2s. 6¾d. to 2s. 8¼d.; damp, mouldy, and part smoked, 2s. 5½d. to 2s. 6¾d.; fair to fine unsmoked, 2s. 6½d. to 2s. 6¾d.; damp, mouldy, and stuck, 2s. 5¾d. to 2s. 6½d. Block, fine pale Lanadron, 2s. 6d. to 2s. 6¾d. Scrap and Virgin, fair to good, 1s. 11½d. to 2s. 2¼d.; mixed and inferior, 1s. 6½d. to 1s. 10d. Rambong, Crêpe, 2s. 2¼d. to 2s. 4¾d.; Scrap and Block, 2s. to 2s. 3¾d. Ceará, Sheet (Castilloa Sheet, 2s.), 2s. 2½d. to 2s. 5d.

Ceylon (248 tons sold).—Crêpe, thick dull to fine, 2s. 6¾d. to 2s. 7¼d.; fair to fine pale, dull to good palish, 2s. 6¾d. to 2s. 7¼d.; light brown and grey, part streaky, 2s. 6d. to 2s. 6¾d.; fair to good clean brown, 2s. 4½d. to 2s. 6¼d.; dark and specky brown, 2s. 4d. to 2s. 5¼d.; dark and black, part pressed, 2s. 3d. to 2s. 4¾d.; dark to good smoked, nothing offered. Sheets, fair to good smoked, 2s. 6¾d. to 2s. 7¼d.; damp, mouldy and part smoked, 2s. 6d. to 2s. 6¾d. Sheets and Biscuits, fair to good unsmoked, 2s. 6½d. to 2s. 7d.; damp, mouldy and stuck, 2s. 6d. to 2s. 6½d. Scrap and Cuttings, fair to fine, 2s. to 2s. 2d.; mixed and inferior, 1s. 7½d. to 1s. 11d.

Manihot.—Good Crêpe, 2s. 0½d. to 2s. 2d.; dark Crêpe, 1s. 10¾d.; pressed pats, 1s. 6¼d. to 1s. 9¼d.

Mozambique.—Good reddish Ball, 2s. 1d. to 2s. 2d.; dark Crêpe, 1s. 11d.

Mexican.—Pressed whitish Sheets, 2s.; soft whitish pressed Crêpe, 1s. 7¾d.

Mangabeira.—Washed Crêpe, 1s. 9d.

Manicoba.—Very sandy Scrap, 1s. 2d.

Malaysian.—Dark brown Crêpe, 1s. 10½d.

Uganda.—Dark Biscuits, 1s. 9½d. to 1s. 10d.; inferior, 1s. 6d.

Assam.—Red and dark Scrap, 1s. 7½d.; heated and pickings, 1s. to 1s. 3½d.

Orinoco.—Caura Sheet, 1s. 7½d.

Coco-nut Products, &c.

ACCORDING to the *Times of Ceylon*, owners of coco-nut plantations have every reason to be satisfied with the results of the 1913 output and sales, and there is every sign to show that 1914 will see a continuance of this prosperity. Copra, as we pointed out at the time, experienced a boom from June to September, when prices went up to Rs. 104.75 per candy (560 lb.), against Rs. 95, the latest quotation (about mid-January) to hand. According to published statistics the Ceylon exports were:—

	1913 cwt.	1912 cwt.	1911 cwt.
Coco-nut oil	531,480	371,676	495,466
Copra	1,097,092	589,990	782,034
Desiccated coco-nut ...	293,632	273,334	275,761
Coco-nut poonac	324,960	162,616	207,527
Total cwt.	2,247,164	1,397,616	1,760,788
„ tons	112,358	69,880	88,039

Coco-nuts (in shell)	16,469,064	15,619,801	15,269,723
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As regards present London values, Messrs. Mordaunt Bros. report that, as regards coco-nut oil, the week ending January 24 saw very little doing, with prices tending in buyers' favour, and during the next week the market again gave way. By February 7th, however, the fall had been checked; and by that date a considerable business had been done at the lowest level, say, Cochin, 46s., and Ceylon, 42s. 9d. to 43s. 6d. c.i.f., against 42s. 3d. for palm kernel oil f.o.b. Hamburg. Prices on February 7th were quoted as follows:—

<i>Palm oil (Liverpool):</i>	1914	1913	1912
Per cwt.			
Lagos	35s. 3d. to 35s. 6d.	33s.	29s. 6d. to 29s. 9d.
Benin	30s. 3d. to 30s. 6d.	29s. 3d.	29s. 3d.
Congo	26s. 3d.	26s. 6d. to 27s.	25s. 6d. to 26s.
Bleached	33s. 9d. to 34s. 6d.	34s. to 35s.	32s. 6d.
Clarified	30s. 9d. to 31s. 6d.	30s. to 31s.	29s. 6d.
<i>Palm kernel oil</i>	42s. 3d.	39s. to 39s. 6d.	34s. 9d.
<i>Coco-nut oil:</i>			
Cochin	54s.	47s. 6d. to 48s.	48s. 6d.
Ceylon	46s.	43s.	43s.
English pressed	43s.	38s. 6d.	39s.
<i>Copra oil:</i>			
Ceylon	None	None	39s.
Cochin	52s.	None	41s.

According to the *Public Ledger* of February 7th, prices ruled as follows (per ton):—

Soya Oil.—Hull: Spot, £26 17s. 6d.; March-June, £26 10s. Oriental easier (in cases) afloat, sold at £25 17s. 6d. c.i.f. Antwerp; January-February sold at £26 c.i.f. Antwerp; February-March, £26 2s. 6d. c.i.f.; March-April, £26 2s. 6d. c.i.f.; April-May, £26 5s. c.i.f.

Coco-nut Oil.—Ceylon spot, £46; January-February, £43 15s. c.i.f.; February-March, £43 15s. c.i.f.; Cochin spot, £54; January-February, £45 10s. c.i.f.

Palm Oil.—Lagos on spot, £36.

Palm Kernel Oil.—February, £42 5s.; March-April, £42 5s. f.o.b. Hamburg.

Soya Oil Beans.—Parcels spot, £8 7s. 6d.; December-January, £8 7s. 6d.; January-February, £8 7s. 6d.; February-March, £8 7s. 6d.

Linseed Cakes.—London made, £7 7s. 6d. to £7 12s. 6d.

Cotton Cakes.—London made, £5 6s. 3d. to £5 7s. 6d.

Copra opened firm and dearer on a good demand and reserved sellers, but after fairly large sales the

market closes quieter, although values are 2s. 6d. to 10s. above the prices ruling last week.

The following are the latest quotations: Malabar, January-February, £30 12s. 6d. buyers, and January-March, £30 10s. Hamburg. Ceylon, December-January and January-February, £29 17s. 6d. buyers Hamburg. Java, October-December, £29 5s. buyers, and January-March, £29 5s. paid Holland, Hamburg and Bremen. Macassar, January-February, £29 buyers, and January-March, £29 Holland, Hamburg and Bremen. Singapore, December-January, £29 2s. 6d. buyers, and February-March, £29 2s. 6d. Hamburg. Cebu, December-January and January-February, £29 buyers Marseilles. South Sea Island, November-December and December-January, £28 17s. 6d. buyers London. F. M. Straits, January, £28 15s. buyers, and February, £28 15s. Marseilles. Manila, December-January, £28 buyers, and January-March, £28 Marseilles. Mixed no Padang, December-January, £28 buyers, and January-March, £28 Marseilles, all c.f. and i. delivered weight.

Coco-nut.—Messrs. Goodlake and Nutter report that the advance in Ceylon has made sellers scarce, and with a little more inquiry here prices have advanced. £43 13s. 9d. has been paid for forward positions and we think there would be further buyers thereat. *Cochin Oil*: This article is scarcely mentioned and we quote 45s. 6d., February-March or March-April. *Palm Kernel Oil*: There has been quite a fair business passing and although it is reported £41 10s. was accepted for a large quantity £42 7s. 6d. has been bidding for February-April, and business done in more distant periods at £42 10s. f.o.b. Hamburg. The market is easier again with sellers at £42. *Pressed Oil*: There is a little inquiry for near at about £42 10s. to £42 12s. 6d., but forward positions are not mentioned. *Spot Prices*: Ceylon, £44 to £46; Cochin, £52 to £54.

The London Cocoa Market.

BY THE EDITOR.

LAST month, it will be remembered, I gave the production and consumption figures of the six chief centres in each case, in which we made out that the deliveries of cocoa in the United States were almost, but not quite, up to last year's figures. Since then we have received from Messrs. Hogins and Lee their annual statement of cocoa movements in New York during the past six years, and according to these, the most reliable table of statistics as regards America that are published, last year not only came up to 1912 as regards deliveries for consumption, but exceeded it by at least 5 per cent., as the following figures show:—

NEW YORK SALES FOR CONSUMPTION.

Jan.-Dec.	1913. Bags.	1912. Bags.	1911. Bags.
All kinds ...	961,792	904,050	816,797
(including)			
Guayaquils ...	121,828	130,805	107,139
Trinidads ...	106,833	104,130	117,855
Grenada ...	20,271	13,314	12,187
Caracas ...	68,283	75,502	89,166
Bahia ...	164,641	116,295	118,866
San Thomé ...	136,575	168,130	113,689
Other African ...	97,459	44,060	37,986
Sanchez ...	164,603	178,715	149,537

The average weight per bag works out at 156 1/5 lb., which gives (in tons) the following:—

Jan.-Dec.	1913.	1912.	1911.
U.S.A. Consumption	150,231,912	142,839,810	127,533,692 lbs.
Equals ...	67,068	63,768	57,403 tons.

America therefore pulled up tremendously at the latter part of the year, for, as shown in our September issue, her consumption at the end of August was estimated at 47,380 tons, against 54,040 in 1912, and 48,230 tons in 1911. Germany, on the other hand, has gone back some 2,000 tons since August, as her figures at the end of the year were 50,000, against 54,000 tons in 1912, or 4,000 tons behind; whilst at the end of August they were only 2,700 tons less. I reckon, therefore, that Germany and also the United Kingdom have a good deal of leeway to make up before their invisible stocks can stand at their usual mark. At the time of going to press, markets generally were firm, and showed a decided improvement in their tone compared to a month ago. In face of all we have heard about large outputs, this may seem strange, but then "there's many a slip," and these large receipts have not yet been offered for sale, unless it is Guayaquils, which certainly have come forward in abundance; on the top of 200,000 qtls. that came to hand (at Guayaquil) during November and December, another 95,000 was received in January. Discussing last year's receipts and production makes one think of prices. Messrs. C. M. and C. Woodhouse's annual report, just to hand, shows that Guayaquils were selling at their highest at the end of June, when Arriba realized 76s. to 81s., and Machala and Caraquez 72s. to 78s. Now (mid. February), as the rates quoted later on show, Arribas are valued at 70s. to 73s., and Machala and Caraquez up to 63s. Compared to this Grenadas are now selling up to 63s., against 67s. to 73s., the highest prices realized last year in March and again in June, whilst Accras touched 58s. to 66s., and Trinidads 75s. to 80s., for mid. red to fine red, against 62s. to 66s. now, showing a drop of 13s. to 14s., against 6s. to 8s. in Guayaquils and 10s. in Grenadas.

The last mail in from the West Indies shows that the reports about the extreme lateness of the Trinidad crop have been verified, for although the fortnight ending January 17th saw over 24,000 bags exported, the fortnightly average since October 1st has only been about 3,500 bags. News recently to hand speaks of higher prices being asked for Accras and Bahias, since floods at these centres were restricting supplies. Last year, therefore, it was the lack of moisture, and now we have too much. Evidently Nature, like certain silly mortals with their wearing apparel, is also inclined to go to extremes at times, instead of striking the happy medium.

Coming now to stocks, these run as under:—

London Stock, February 7th	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads ...	7,443	2,821	4,915
Grenadas ...	5,680	2,822	11,536
Other W.I. ...	3,703	4,651	7,184
British Africa ...	9,579	7,682	12,756
Portuguese Africa ...	5,515	5,031	6,288
German Africa ...	2,327	7,402	5,098
Ceylon and Java ...	11,643	12,182	9,057
Guayaquil ...	22,609	15,278	45,040
Brazil and Bahia ...	673	2,959	1,167
Other Foreign ...	10,877	7,980	7,827
Totals ...	80,049	68,808	110,868

	1914.	Value.	1913.	Value.
Havre Stock, January 31st—	Bags.	Fcs.	Bags.	Fcs.
Pará	250	82 to 87	13,006	83 to 86
Bahia	4,309	74 „ 78	12,728	78 „ 85
Venezuela	5,258	76 „ 200	16,041	86 „ 200
Trinidad	890	78 „ 82	17,311	84 „ 88
Grenada and O.W.I.	152	71 „ 80	2,893	78 „ 85
San Thomé	4,186	77 „ 79	1,289	81 „ 83
San Domingo	238	70 „ 74	9,409	71 „ 76
Haiti	3,655	63 „ 75	7,393	65 „ 79
Accra	21,887	70 „ 72	45,249	73 „ 76
Guayaquil... ..	9,944	73 „ 78	23,927	78 „ 85
Others	1,249	—	6,039	—

Totals ... 52,018 bags 155,285 bags

Coming to the consumption in the United Kingdom during January, the deliveries of raw cocoa for home consumption showed for once an increase, whilst that for foreign export was behind, as follows:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (Jan. 31st)
	Tons.	Tons.	Tons.	Tons.
January 1911—	5,800	2,514	516	12,701
„ 1912—	4,287	2,792	750	9,911
„ 1913—	6,464	3,171	704	12,769

Incr. 2,177 Incr. 379 Decr. 46 Incr. 2,858

Against the above foreign manufactured showed 751 tons landed (against 1,024 last year) and 769 delivered for home consumption, against 993 tons in 1913.

Although by the time this issue is in the reader's hand the excitement will have subsided, sales and value will still be based on rather exalted ideas as regards Accra kinds. For these 58s. 6d. at least was paid at one time, and although such a price is already a thing of the past, even 56s. to 57s. are relatively high for the time of the year, December and January being the bumper months for exports; but then the crop during these two months saw only 16,000 tons leave the coast, when possibly 20,000 were expected on the basis of the January-November shipments. Some of those selling forward, therefore, seem to have got pinched, and hence the rise. Floods in Bahia are also causing sellers to try and “boom” prices, but as with coco-nuts the “boom” so far has been mainly on paper. On account of this an all-round rise of 1s. or so has been noticeable of late, whilst Accra kinds are 3s. or more higher.

On the basis of recent sales values run as under:—

Trinidads.—Superior sold at 71s., fine red marks at 65s. to 66s., good mid. red 63s. to 64s. 6d.

Grenadas.—Good and fine marks, 62s. and 63s.; good reddish, 60s. and 61s.; common unfermented to good fair fermented, 54s. to 59s.

Dominicas.—Good fair to good red, 57s. to 61s.; common unfermented to fair fermented, 50s. to 56s.

St. Lucias.—Fine marks up to 63s. 6d.; good red, 60s. to 62s.; ordinary unfermented to good fair, 55s. to 59s.

Jamaicas.—Good red, 64s.; common and unfermented, 55s.

Costa Rica.—Good to fine marks, 60s. to 63s. 6d.

Caracas.—Good bold clayed realized 82s.

Cameroons.—Good reddish realized 61s. 6d.

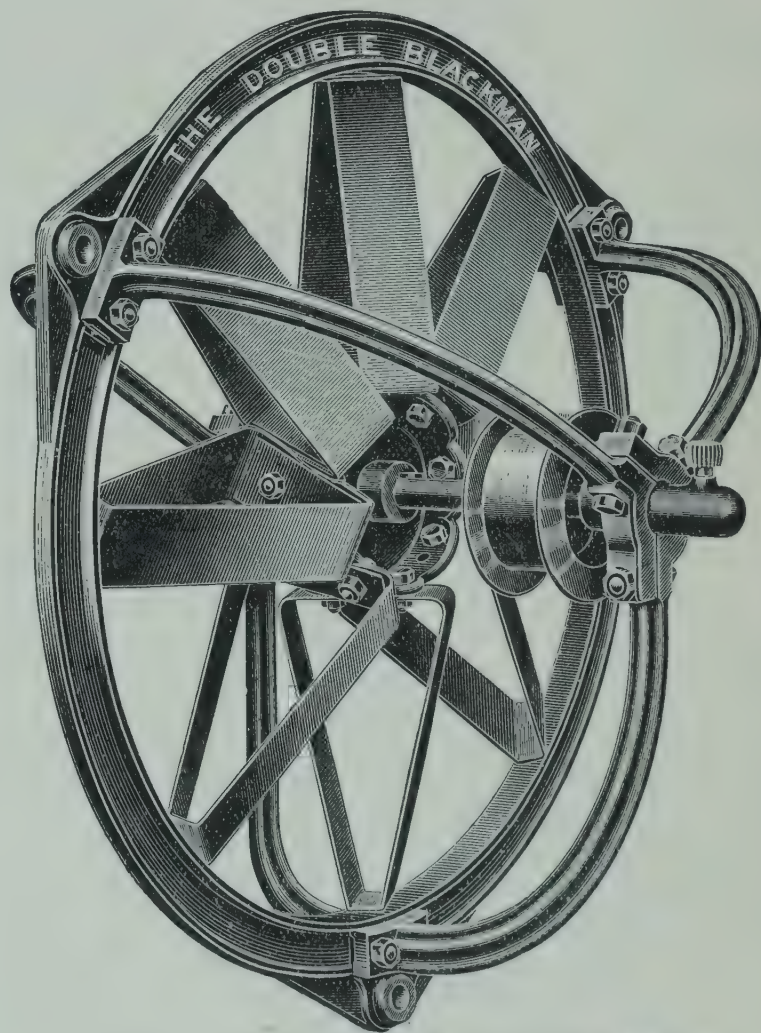
Guayaquils have been selling more freely, mostly Caraquez kinds at 60s. to 62s.; whilst 68s. has been paid for Arriba, and 59s. 6d. for Machala.

Ceylons have been selling freely at steadily rising prices. Good bold, 86s. to 88s. 6d.; good medium up to 80s.; ordinary to fair, 71s. to 77s. 6d.; whilst fair to good “Native” has been realizing 53s. to 68s. and up to 74s. for a bold lot.

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VOL. X.—No. 3.]

MARCH, 1914.

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Our Books.

PRESSURE of space has prevented us from inserting in these columns, as we intended, the latest press notices on our last two books, viz., "The Fermentation of Cacao," and the second edition of "Coco-nuts—the Consols of the East." We have, however, included some of them in our advertisement pages, xxviii and xxxiii, to which we must refer our readers. At the same time we would take this opportunity of replying to some criticisms of Mr. E. L. Killick, in the *Financier* of February 13th. Put briefly, this authority finds us too optimistic in this book, and Sir William Lever still worse. "In view," Mr. Killick says, "of the uniform non-success of coco-nut cultivation under European control in the Middle East, particularly in conjunction with rubber planting, it would be interesting to know in what part of the world the industry is attended with the dazzling prospects referred to by Sir William Lever. Malaya is quite a favoured country for coco-nut growing, the trees often coming into bearing at five years of age, yet there is not a single company operating therein that can point to profits bearing even a remote resemblance to the results said to be obtainable." Leaving Sir William Lever to look after himself, which he does in his Foreword to the second edition of our book, we would remind our readers that we have always written down and discounted reported outputs, and that in any case, whilst welcoming concerted action, we do not write for the Stock Exchange or company promoters, good or bad, so much as to induce men with capital of their own, or who are able to command same to go to the Tropics and take up planting (coco-nuts, cacao, rubber, cotton, or even sugar if they go as cane-farmers only and have a central factory, run perhaps on a co-operative basis to take their canes), and to run these estates at their own risk. It is this individual effort in the past that has caused the Tropics to be on the firm foundation they can claim to-day, and coco-nuts, and cacao especially, are two products which will always pay the careful individual planter better than the company-managed concern. Planters certainly have done well in the West Indies, and if the native competition in the East drives them away—though we doubt if it need do so, either as regards Malaya, India, or Ceylon—then let them all come out West or go to the South Seas, Queensland, &c., where, given the knowledge and suitable conditions, we feel sure coco-nut or cacao planting will pay individual planters, now and in the future, as it has done in the past; that is, provided the estates are run on the lines of the old days as regards the cost of living and personal expenses. Motors, club life, picnics and social functions have to be left on one side by the fighter, agricultural or otherwise.

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The Practice of Cacao Fermentation.

By ARTHUR W. KNAPP, B.Sc.Lond., F.I.C.,
B.Sc.Birm.

I WAS sent to Trinidad by Messrs. Cadbury Bros., Ltd., chiefly for my health's sake. Whilst there, through the kindness of various planters I was able to observe the methods of fermentation on some twenty plantations, and in some case I was permitted to carry out experiments. In the notes which follow I restrict myself to a consideration of the *practice* of fermentation.

On the whole Trinidad cacao is well fermented, and the only reason that more care is not taken is that the difference in the price obtained locally is not commensurate with the extra trouble. The Trinidad broker appears to judge largely by the external appearance, so one finds some capable scientific planters satisfied with the sweat-box they found on their plantation, and not even attempting to separate the diseased and germinated beans, but instead clay-ing up to the right appearance. Too much attention is given to making the cacao look right. It would be an advantage to manufacturers if they could encourage more attention being given to the real internal quality of the bean. I should have thought that it would have been an advantage in Trinidad for an association of planters to fix a standard which prohibited the presence of unfermented, diseased, germinated, or grubby beans, and to have all bags of beans passing this standard suitably marked. The effect of putting on the market large consignments of an equally high quality would be sure to enhance the price on the London market.

WHY FERMENT?

The following is a brief comparison of fermented beans compared with beans dried direct in the sun:—

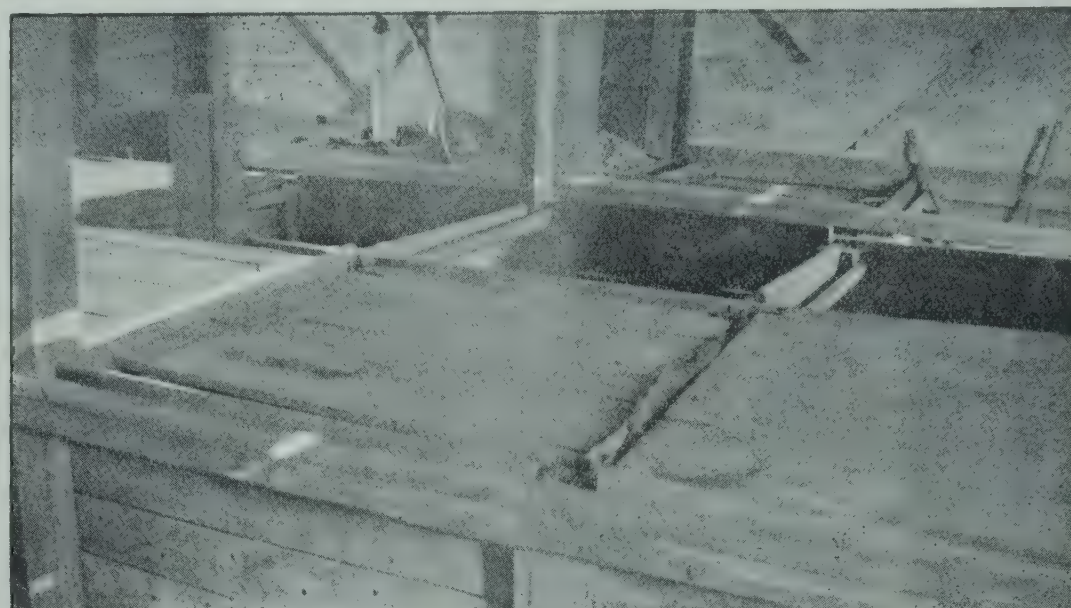
	Dried beans	Fermented beans
Shape	Flat	Plumper or rounder.
Shell	Soft	Crisp, usually darker outside; note the dark-brown colouring deposited on inside of shell.
Looseness of shell ...	Shell tight	Shell more or less free.
Colour of interior ...	Mud or slate-colour to black	Bright; light and dark browns (and purples).
Consistence of interior	Leather to cheese ...	Brittle; crumbles readily.

The above shows the extreme differences. In practice the dried beans are generally slightly fermented.

When dried unfermented beans are roasted the product is inferior to the roasted fermented bean in all respects. It is very different from cacao, having a herbal odour, a grey colour, and a rather astringent taste. It will be seen from this how desirable it is that beans should be fermented. However, the planter may object that, whilst there is a gain in quality, there is a loss in weight as compared with drying. Beans which are fermented are said to be lighter than those which are merely dried. Now the beans lose certain constituents, but they gain oxygen.

In an attempt I made on a small scale, selected

Criollo pods from one tree were taken and the beans mixed, and half put in a muslin bag. This bag was put in the midst of the beans in the sweat-box, and the contents underwent the usual fermentation. The other half were dried. This experiment was repeated with the beans most unlike Criollo—that is, Calabacillo. The results obtained were as follows:—



Sweating-boxes. The use of wooden lids is very unusual in Trinidad.

Pod	Beans	Average weight per bean.	Number per lb.	Shell	Moisture in shelled beans	.. Butter in "shelled beans
		Grms.		Per cent.	Per cent.	Per cent.
Trinidad }	Unfermented	1·682	270	17·0	5·02	60·22
Criollo }	Fermented	1·716	260	13·3	4·87	54·74
Trinidad }	Unfermented	0·893	510	16·1	5·03	53·33
Calabacillo }	Fermented	0·854	535	15·1	5·15	50·01

The above results show (1) that whilst the fermented Criollo beans were 2 per cent. heavier than the dried, the fermented Calabacillo beans were nearly 5 per cent. lighter than the dried; (2) that, contrary to expectations, there was on fermentation a loss of butter in the shelled beans. This butter had not passed into the shell.

Instead of giving a long account of the various types of sweat-boxes that I saw in Trinidad and Grenada, it seemed to me better to condense the results of my observation and experience into a recommendation of what I considered the best type. Whilst the conditions are given for Trinidad, with some modification they should hold for other climates and other types of beans.

The *general conditions for good fermentation* are that (1) The mass of beans must be kept warm; (2) the mass of beans must be moist, but not wet; (3) in the later stages there must be sufficient air; (4) the boxes must be kept clean.

HOW TO OBTAIN A GOOD FERMENTATION.

(1) *The Sweat-boxes. Material.*—This should be hard native wood. Pitch pine is rapidly rendered rotten by insects. In Trinidad cedar and cyp are the best native woods for this purpose. As few iron nails as possible should be used (see Appendix B). The floor should be of concrete, smoothed with cement, and the roof may be of corrugated iron.

Position.—The boxes should not be in a very exposed position. It is often convenient to build them under the drying floor.

Construction.—A wooden shed, about 10 ft. high, is divided off by movable boards into boxes. The concrete floor of the shed is so shaped that the sweatings run along channels out of the building into a small, covered, cement-lined pit. The boxes should be raised about 6 in. above this floor on uprights, so that the air can circulate freely beneath them. There should

be a space of about 4 in. between wall of building and side of box, thus forming a *double wall* with air space (see Appendix B). The boxes should be about 4 ft. each way (for reason of this size, see Appendix B), the boards fitting into grooves and being readily removed. The floors of the boxes should be made of boards about 3 in. wide, placed about $\frac{1}{4}$ in., or less, apart, fastened together by cross-pieces, and the whole grid made removable

for cleaning. The roof should hang over about 4 ft. to protect the beans from the rains during charging, and the walls from the sun. The shed should be ventilated at the top. A simple method is to remove a 6 in. to 12 in. board from that side and end of the shed which are least exposed to the prevailing winds, and cover the slits with wire-netting. The area of the shed must be such that it will take two 4 ft. x 4 ft. boxes for every 8 cwt. of dry beans that are to be produced per week.

(To be continued.)

MESSRS. ROBERT WARNER AND Co. write us that they have secured the services of Mr. E. G. Wolfe Barry as their sole representative in London and outlying districts, and that their London address will now be 25, Victoria Street, Westminster, S.W.

THE other night we wandered across to the Shaftesbury Theatre to see *The Pearl Girl*, and enjoyed it immensely, whilst the man in the next seat was reduced to such extremes at times that we distinctly heard him beseeching the fates and Mr. Alfred Lester to grant him some respite from the continuous laughter. Having seen the play we now understand why officers are so anxious to join the Royal Mail Service, especially their Brazilian and Argentina route; the chance of marrying a Madame Alvarez is too good to miss, once you can persuade the directors to take you on. Probably it was the knowledge of how particular Sir Owen Philipps and his colleagues are that induced Madame Alvarez to succumb to the first officer of the R.M.S. *Parana*.

Who says rubber does not pay? Ceylon certainly cannot when conditions are favourable and the estates

well managed. Those who think otherwise should have scanned the Ceylon papers in by the mail of February 28th; had they done so they would have seen that the "Rubber Plantations of Kalutara" (Messrs. Bois Bros. and Co., agents) have declared 110 per cent. dividend, besides placing Rs. 135,000 to reserve, and carrying forward Rs. 4,523.77 cts. = Rs. 139,523.77 cts. in all (about £9,000). This estate, by the way, has been thinning out its trees to 160 per



Cacao in the fermenting or sweating-boxes. The banana leaves encourage fermentation by partially shutting out the air.

acre ($16 \times 16 = 170$). Then the Kongsii Rubber Estate declared 40 per cent., and two of Messrs. Geo. Steuart and Co.'s Agencies 60 per cent. ("Ceylon Rubber Co.") and 22 per cent. ("Remuna Rubber Co."). On the other hand, we are told in the report of the Rangalla Planters' Association (Ceylon) that many tea-cum-rubber estates are cutting out the rubber; this looks as though tea paid best down that way.

"It is only very occasionally, indeed," an editorial notice in the last issue of the *International Sugar Journal* tells us, "that reference is made in these notes to the advertiser's section of this journal; but we cannot refrain this month from drawing attention to the noteworthy fact that our advertising pages (royal octavo) which just ten years ago numbered twenty-six in all have this month attained to the large total of sixty, a rapid increase in the past few years."

Tobacco Planting.

PART IV.

THIS month let us discuss Ceylon, as we have many readers in that island who seem interested in these articles, whilst, of course, everyone is interested in Ceylon. The press of that island, i.e., *The Times of Ceylon* and *The Ceylon Observer*, have repeatedly called the attention of their readers to the steps being taken by the Ceylon Agricultural Department to put the matter of tobacco cultivation, especially in the north of the island, on a sure and satisfactory footing. An experimental farm is to be established at Jaffna, probably has been by now, and here a ten-acre plot will be laid out in which seed from South and Central Africa will be sown; and the Department has ordered out seeds of the best Cuban, Sumatran, American and Turkish kinds that have been grown successfully in Africa.

It seems likely that tobacco and coco-nuts can be grown together with advantage; we say this because, according to an interview the *Times of Ceylon* had with Mr. C. V. L. Valabane, we learn that:—

“A Negombo correspondent has mentioned having seen a plot of ground about a rood in extent, in the middle of a coco-nut tope, with tobacco in luxuriant growth. Tobacco will undoubtedly grow luxuriantly in all that country by the seaside, because the soil is excellent, containing much silt, and being rich in potash and chlorine, as can be judged from the remarkable growth of the coco-nut trees and the fine crops produced. The coco-nut trees, however, absorb chlorine. The coco-nut tree takes up what is bad for the tobacco, but what is beneficial to itself. In Sumatra one year before they plant tobacco on lands near the sea they give the fields to the native Malays for dry paddy cultivation as the cereal takes the chlorine and other constituents which are not beneficial to tobacco out of the soil. Chlorine is found mixed with soda as in common salt, or with lime as in lime chloride, or with potash as in potash muriate. Soils, or manures, containing a large percentage of these substances are not good for tobacco, but are excellent for a different order of plants. Fresh stable manure is rich in chlorine and is injurious to the tobacco plant when used immediately before planting. The native tobacco cultivator added large quantities of chlorine to the soil by tethering cattle on the plot of land on which tobacco is to be grown, and by working in large quantities of cattle manure into the soil. Cattle urine, which contains a large quantity of chlorine, is absorbed into the soil, and it is not surprising that good burning tobacco leaf is not produced by the native cultivator, and that the leaf used for cigars has to be doctored. In soils rich in potash, chlorine has not much effect; and when manure is used it should be thoroughly fermented and well decomposed.”

Elsewhere we are glad to see that Mr. Valabane goes on to claim that Ceylon can produce the finest leaf to compete with Manilla, so that it will be an excellent thing if some of the large exporting firms in Colombo took up the matter of tobacco cultivation for the European market—as the Government cannot be expected to undertake such work, i.e., give advances, and bale and ship the product. Estate owners in the Island can also join in the movement. It will be desirable, however, to cure and ferment the leaf in

one central factory, if possible, as that will give better results than if the leaf is cured by individual producers on their plantations, and it will also be much cheaper in the cost of production. Tobacco from start to harvesting, he claims, requires only nine months, and the yield is about 1,200 lb. per acre. The price in Europe is about 50 cents a lb., or Rs. 600 for the produce of an acre, which will give you a profit of about Rs. 350 per acre, after meeting all expenses. If estate owners take the cultivation of tobacco in hand the leaf can be delivered in the central factory for curing at the rate of 15 to 20 cents a lb., whilst as regards yields Cuba and Africa often yield from 2,000 to 2,200 lb. to the acre, and this is perhaps also possible in Ceylon.”

(To be continued.)

Coco-nut Notes.

REPORTS of the Ceylon Board of Agriculture tell us that specimens of coco-nuts showing signs of a kernel disease have been received from Negombo district and submitted to the Government Mycologist for investigation. According to a computation made by a competent authority there are at present about thirty estates yielding a million nuts each per annum, while several others will reach that output in a short time. A communication received from New York describes a new method of preserving the fresh kernel of the coco-nut by means of a harmless and tasteless preparation which is said to counteract the acid responsible for bringing about rancidity. The object of this system of treatment is to put on the market a product which would be an improvement on desiccated nut and more suitable for the purposes for which it is employed, and enable the producer to make larger profits.

AN interesting agricultural experiment, the *Indian Planters' Gazette* tells us, is to be carried out within the next few weeks on a coco-nut estate within a few miles of Colombo. The owner, a well-known Singhalese gentleman, has determined to try the effect of proper cultivation, and he is going to put the whole of a 300 acre estate under the plough. Implements are now on order from Australia, and he is also importing four strong Australian horses for draught purposes. The experiment will be watched with interest, and should it result in an increased crop of nuts similar cultivation will no doubt be carried out on many other estates. The proposal is one which gives us much pleasure to read about, and we wish the Singhalese gentleman every success. Those who have studied our handbook on “Coco-nuts” will remember how strenuously we urge the necessity of ploughing and cultivating the land between the palms, as we know this must be done to give best results. We are a little surprised, however, at Ceylon going to Australia for her implements, unless it is that, since Australia supplies such excellent draught horses, she might as well send the ploughs too. Those who have tried Ransome's ploughs and cultivators find they are excellent for the class of cultivation necessary under coco-nuts, so we hope, with all goodwill for Australia, that the next lot of implements will come from this side; meanwhile, from all accounts, ploughs and cultivators, the same as spraying machines, will, in future, be found on all well-managed estates.

The Clove Industry in Zanzibar.

GOOD OPENINGS FOR BRITISH CAPITAL AND ORGANIZATION.

THE following statements by the English Consul at Zanzibar, as Messrs. Schimmel and Co. very truly point out in their semi-annual report for October, 1913, are worthy of serious consideration, and it is to be hoped that they will also be properly appreciated by the important firms which are taking, and others which, furthermore, would do well to take, a prominent part in the clove trade and could organize the cult of the trees and the collection of their crops, for no one can deny that the conditions under which cloves are produced have become steadily more untenable for years past. Much has already been written about tropical agriculture, and the absolute necessity of a systematic development of the vast and fertile tropical agricultural domains of the Empire has been insisted upon. Although the islands of Zanzibar and Pemba are small in extent they possess in their clove industry not only a valuable, but a unique source of revenue. The clove-trees, generally speaking, are not much subject to disease, but in spite of this fact, many of them die off in a quite inexplicable manner. It would be a worthy task for a capable botanist to trace the source of this mortality, and in other respects also he would find an interesting sphere of activity in the islands, where he might possibly turn his knowledge to more profitable account than in any other place. The economic condition of the Indians is not so favourable as might perhaps appear at first sight; they have difficulty in collecting the interest on their mortgages and if, owing to arrears of payment on the part of the debtors, they are compelled to take over the estates, they are unable to continue the cultivation themselves owing to want of knowledge of the work. As a result, both the Arabs and the Indians are inclined to dispose of their "shambas" at reasonable prices, and there should be favourable opportunities for Europeans to acquire landed property. The principal reasons which have so far stood in the way of European colonization were the unhealthy climate, the want of roads and the lack of labour. The first-mentioned two drawbacks have been overcome in the meantime. Hygienic conditions have been improved and the European portion of the population has acquired greater power of resisting the perils of the climate. Throughout the island of Zanzibar there are now good roads for power-vehicles and similar roads or light railways are projected in Pemba. As a result of these improvements it is possible for European planters to live at the coast and yet to be within easy enough access of their plantations in the interior to keep an eye on them. It is true that the population of the islands is dwindling and that it is just as difficult there as on the African continent to procure labour, but the importation of labour from India might be considered.

As we stated last month, by far the most important plantations in Zanzibar and Pemba are those of cloves, and they are at the same time the principal source of revenue of the Sultanate, which levies an export duty of 25 per cent. on the product. The Government owns 17,000 acres of clove plantations, the administration and control of which are entrusted to a special branch

of officials. As is to be seen from the tables given further on, the result of the clove crops varies very considerably, a poor crop usually following a good one, and *vice versa*. The crop of 1911-12, calculated from July 1st, 1911, to June 30th, 1912, yielded no less than 808,794 frazileh, thus materially exceeding the previous record crop of 755,665 frazileh of the year 1907-8. The yield in 1912-13 was small, but 1913-14 again promises an excellent result. In spite of this favourable situation, however, the whole industry of clove-growing is in need of thorough overhauling and reform. The principal difficulty lies in the fact that the ownership of most of the land has passed out of the hands of the agricultural population into those of persons who are not connected with agriculture, that is to say, from the Arabs to the Indians. It is notorious that in the year 1897 the Arab population suffered a heavy blow from the abolition of slavery, for this deprived them of their cheap labour and wages rose in proportion as the entire economic situation of the East African mainland improved. The economic future of the islands is greatly endangered by the fact that a large part of the old plantations has become a complete wilderness, and that, although it requires from seven to eight years before a young clove-tree begins to bear, and ten years before it yields a crop worth mentioning, scarcely any new plantations are being laid down outside the Government estates.

The consular report from which we have quoted contains two statistical tables, which we produce below:—

DELIVERIES OF CLOVES DURING THE LAST FIVE SEASONS
FROM JULY 1ST TO JUNE 30TH.

Crop	Zanzibar Frazileh	Pemba Frazileh	Total Frazileh
1907 to 1908	213,667	541,998	755,665
1908 „ 1909	165,733	449,685	615,418
1909 „ 1910	109,682	300,043	409,725
1910 „ 1911	51,996	139,307	191,303
1911 „ 1912	218,023	590,771	808,794
1912 „ 1913 (February 28th)	21,098	98,207	119,305

EXPORTS OF CLOVES IN THE YEARS 1910 TO 1912.

To	1910 Cwts.	1911 Cwts.	1912 Cwts.	1910 £	1911 £	1912 £
England	5,052	23,939	16,361	14,335	54,117	40,189
France	1,683	3,069	1,845	3,950	7,026	4,324
British India ...	59,106	76,070	56,735	139,946	198,239	168,935
Netherlands ...	15,053	938	—	28,828	1,975	—
Germany	19,440	36,014	32,104	37,354	84,506	76,903
Austria-Hungary	629	2,453	2,048	1,415	5,401	4,250
Italy	1,005	2,813	1,156	2,337	6,076	2,394
United States ...	9,787	31,436	23,005	20,240	70,065	38,063
Other Countries...	2,380	4,173	2,924	5,065	9,586	7,115
Total	114,135	180,905	136,178	253,470	436,991	342,173

According to a report by the French Consul, dated July 22nd, the preliminary estimate of the 1913-14 crop is 140,000 bales, of which Pemba may produce 110,000 and Zanzibar 30,000. The yield of the last crop totalled about 75,000 bales.

The clove plantations in Madagascar are developing satisfactorily. From the report of the British Consul there we see that the exports in the year 1912 amounted to 207 tons, against 128 in the previous year. The plantations consist of 400,000 trees, of which 230,000 are on the island of Ste. Marie.

Tea Notes.

THE Chairman of the Pitahaude Tea Co. of Ceylon, Ltd., in declaring a 50 per cent. dividend, besides expending a considerable amount on bringing the factory, machinery, aerial tramway, bungalow and water supply schemes all up to date, gave some useful details of how this estate is being managed that other planters will do well to take note of.* One thousand acres are planted in tea in full bearing, and, in spite of two cyclones and other unfavourable weather conditions, these gave the highest yield yet recorded from the group, *viz.*, 703 lb. per acre all round; 715,430 lb. were produced, against 650,000 lb. last year, and the average price realized was 43·85 cts. per lb. (100 cts.=1s. 4d.), as against 41·11 cts. lb. in the previous year, whilst the tea cost to produce 28·88 cts. per lb. delivered to buyers, including 4·50 cts. for manure. The profit per acre on the tea was £7, and the profit per acre on the rubber £36 4s., this, too, from land that had been seventy-one years in continuous cultivation. These excellent results have been secured to a large extent through long-continued liberal manuring and cultivation, combined with a better supply of labour and improved health conditions.

The High Forest Estates Co., Ltd., also of Ceylon, cropped 810,829 lb. of tea, against 709,334 lb. last year, whilst the cost of production was 31·54 cts. per lb., including 4·54 cts. per lb. for manuring and cultivation, against average sale price 51·16 cts. per lb. and 51·86 cts. in 1912, and yet the directors were not satisfied with the price, and hope to do better this year.

In face of such favourable results one notes as a contrast that, at their last meeting, the Kalutara Planting Association reported a big reduction was to take place in the 12,000 acres under tea during the next few years. In this connection it would be noticed that tea, which had hitherto held premier place in their reports, had now given way to rubber. This should not be taken as an indication that they had done with tea. Where tea had been preserved as a separate product they were able to still show some of the finest tea to be seen anywhere. (On p. 43 we show that in Ranggalla District it is the rubber that is being cut out.)

The steady increase in the consumption of Ceylon and Indian teas should be carefully noted, writes the *New York Tea and Coffee Trade Journal*, on February 3rd. These teas are rapidly taking the place of Japanese in various sections of the country. The increase of over 6,000,000 lb. of Indian tea for the year should not be overlooked.

The first auctions this month, write Messrs. W. J. and H. Thompson, passed with spirit, and bidding was strong and animated up to 9d. per lb. There has been no check to the upward tendency of prices for all grades at and under this figure, and there is now a marked scarcity of tea below 8½d. per lb.

Short supplies from Ceylon, China, and Java, and increased consumption of all growths has created an abnormal and somewhat strained position, and any relief that the excess of about 8,000,000 lb. from Northern India might have afforded has been discounted by a close consideration of the absorbing capacity of the trade at the weekly auctions.

* The *Times of Ceylon* devoted a column of small print to a report of this Company's meeting.

Later news tells us that the auctions to March 12th for Indian and Java teas passed off with a good tone, the former, however, close with a slightly irregular tendency and it is many weeks past since so much tea was withdrawn; useful medium and common kinds continue to attract most attention, but the Trade is more discriminative for this grade of tea. For Autumnals a fair demand is still in evidence, but previous rates have not always been maintained, and there are indications of a less eager inquiry for these qualities. On the other hand, Ceylons have met with a strong and active market and must be quoted, if anything, dearer for nearly all grades running above 9d. per lb. With Indians the average for the whole Sale on Garden Account is 9½d. per lb., against 9d. per lb. a year ago, compared with the Ceylon average, 9¾d. per lb. against 9¼d. per lb. last year.

Our attention was called the other day to the following advertising paragraph put out presumably by a firm interested in the sale of China tea, but further particulars than those given were missing, so cannot be included. Those, however, who have a file of the *Daily Mail* at their disposal can soon learn the full facts of this memorable visit of their Majesties to the London Docks.

"VISIT OF THE KING AND QUEEN TO THE LONDON DOCKS."

"In the Tea Department, His Majesty was informed that the majority of the stores were from India and Ceylon. 'Personally,' said the King to one of the storemen, 'I prefer China tea and nearly always drink it when I can obtain it. The flavour is more delicate.' The Queen agreed."—*Daily Mail* report, February 23rd, 1914.

It is worthy of note, says *The Agricultural News*, that conditions in St. Kitts are probably suitable for the growth of *Aleurites fordii*, the useful and ornamental wood oil tree of the Central Provinces of China, also that the manurial experiments with pine-apples that have been carried out seem to indicate that proper nitrogenous manuring will pay with this crop.

As the best way to maintain peace is to be prepared for war, so the best way to guard against influenza, colds, &c., which are so prevalent at this time of the year, is to maintain the body at its full strength and vigour. We know of nothing which will do this so effectively as the constant use of Horlick's Malted Milk, a complete diet containing pure, full-cream milk combined with wheat and barley-malt—nutrients which are very desirable for health's well-being. For those who are below par Horlick's Malted Milk is also an unfailing help in restoring lost energy and in securing the return of robust health. In a moment the powder can be made into a pleasant and sustaining beverage by stirring briskly in hot or cold water. Horlick's Lunch Tablets are delicious food confections of great nutritive value, and may be dissolved in the mouth when required; the glass flasks in which they are supplied may be carried conveniently in the pocket. We can confidently recommend the use of this ideal preparation in both powder and tablet forms to our readers of all ages.

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART IV.

The "Ubel" Machines of the United Brassfounders and Engineers, Ltd.

Two factors have recently increased and consolidated the use of spraying machines in the home markets to a considerable degree, and the second, if not the first of these, will also encourage their use overseas as well. The insistence now being made by the Home Office and local authorities generally on this side that all buildings, &c., in which articles of food are stored or being prepared, or where workpeople are employed, should be periodically limewashed, &c., has caused it to be essential and easiest for owners of such businesses to bow to the inevitable and thoroughly limewash and otherwise clean and disinfect the walls and interiors with evenly spread coatings of white-wash. Applied with the precision now obtainable by the use of a modern perfected nozzle, it has come to be recognized as a well proven fact that the lime can penetrate to and exterminate or remove bacteria and dirt in a way that no brush-slapping can achieve.

So much for use No. 1—one that is rapidly extending over here, as it will do all through the Tropics now that the Schools of Tropical Medicine have proved the



The "Ubel" Knapsack Sprayer.

advantage of substituting modern ideas of hygiene and sanitation *in lieu* of the old dirty and pest-infected walls and buildings that have prevailed hitherto.

Coming to use No. 2, this refers to limewashing the interior walls of motor garages, an adjunct to-day to every up-to-date establishment, and also to washing the cars themselves carefully, effectively, and expeditiously. The most beautifully enamelled car, as well as the most weather-beaten and surface-cracked old stager, can alike be swished down, the new pet with a spray as fine as a scent spray, and the latter with a jet that would do good work on the deck of a man-o'-war.

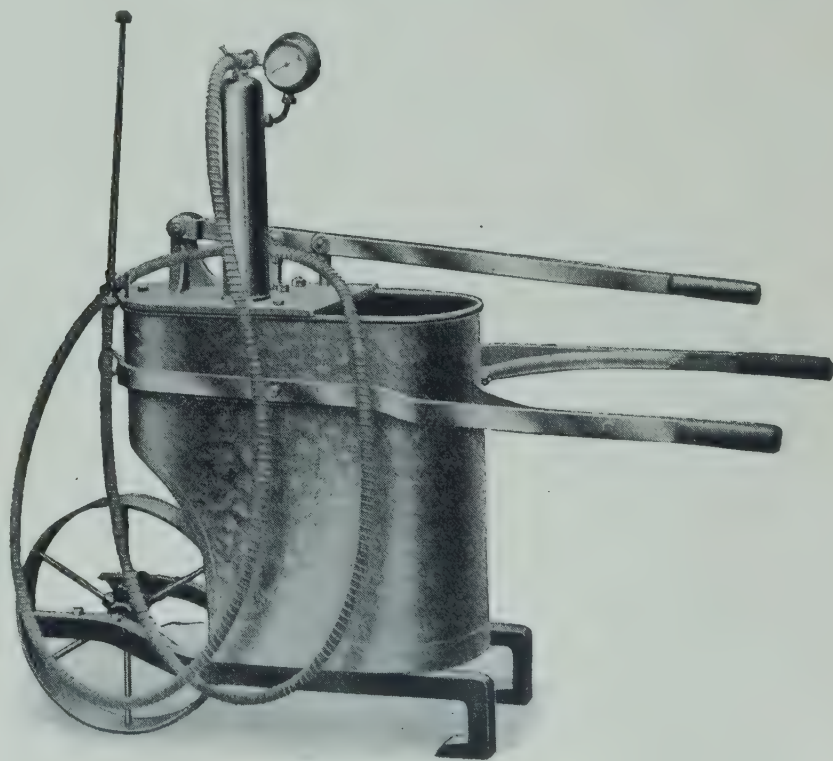
The "Ubel" limewashing and spraying machines of the United Brassfounders and Engineers, Ltd., of Birmingham, Manchester, Halifax, and Woodchester, are now being much used for the purposes described above, as well as for the more general one of spraying crops to protect them from insect and other pests, or to destroy those already existing. To secure the apparatus that can do this effectually has required much patience and ingenuity on the part of those who have designed the machines and put them on the market. Among such the "Ubel" machines enjoy a leading position,

being powerful and efficient, and yet easy to work without clogging on account of the valves being of brass. With their machines estate owners can, it seems to us, be sure of an even air-pressure and equal distribution of the various fluids, thereby avoiding waste, and yet making sure of all parts of the trunk, branches, leaves, or fruits being thoroughly treated.



The "Diaphram" Knapsack Sprayer.

Take their "Ubel" pneumatic knapsack machine, for instance, costing about 43s. This is made entirely of copper, except the pump, valve box, valves, and air chamber, which are all brass. A strainer is fitted to the lid, and the machine has an improved patent automatic agitator which stirs up and evenly distributes all mixtures. It weighs less than 15 lb., and holds $3\frac{1}{4}$ gallons. A somewhat cheaper but very reliable sprayer is the "Diaphram," or Vermorel

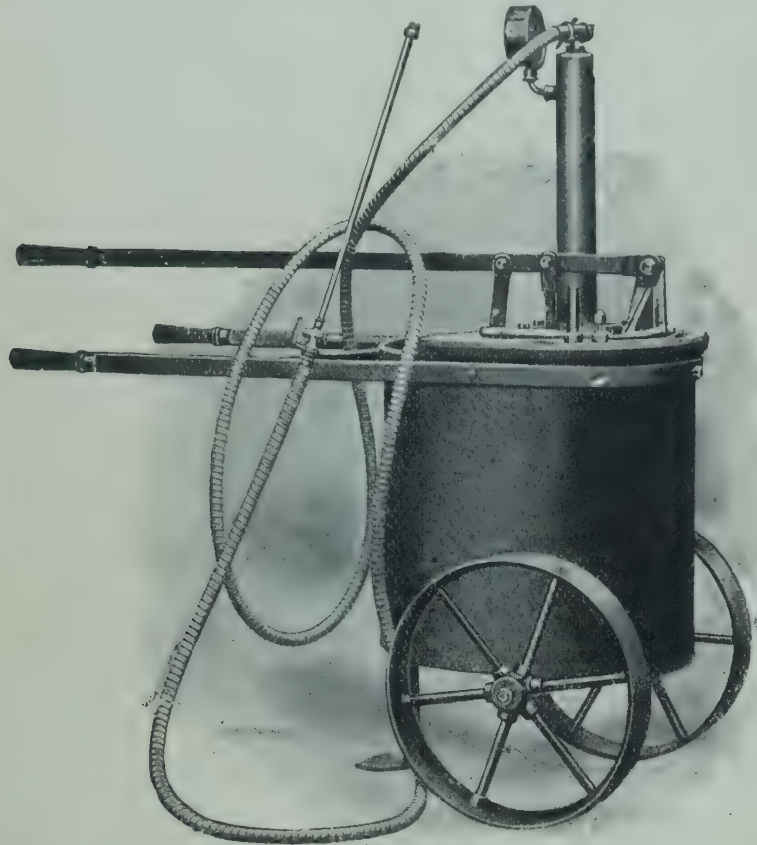


The "Ubel" "Lincoln" Tank Sprayer.

pattern, which is also made of copper, and has been made principally to spray fruit trees, cacao, tea, coffee, and other crops, also holding $3\frac{1}{4}$ gallons; it weighs 14 lb., and costs a few shillings less than the "Ubel."

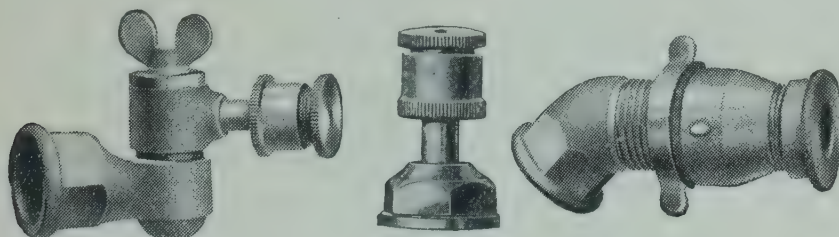
With regard to the larger machines, the "Ubel" "Lincoln" tank sprayer, capacity from 10 to 18 gallons, and costing £9 to £11, can do excellent work,

With a brass pump, air vessel of ample size, and brass ball valves, the life of the machine is a good one, whilst the force and area of the spray has made the machine a prime favourite for bushy orchards or plantations as



The "Ubel" Tank Sprayer "Devon."

fruit bushes, coffee estates, tea gardens, &c., especially as the pump is sufficiently powerful to supply two jets at once, and a connection is provided for an extra length of hose. It will be noticed that this machine is narrow in shape and has only one wheel, thus enabling it to be used in close plantations. The same can be said of the "Ubel" Devon machine of 15 gallons capacity, and costing about £10; this machine is suitable for heavy work, and is provided with two wheels.



Swivel Excelsior.

Excelsior.

Elbow Adjustable
Steel Disc.

The most important portion of a spraying machine is the nozzle; in fact, it is the business end of the proposition. The Ubel makes have had most careful consideration, and been the subject of careful design and experiment. Their Excelsior Nozzle is one that may be safely used with limewash or any other dense liquid without fear of clogging. The Elbow Adjustable Nozzle is largely used for fruit trees, as it gives a powerful spray which can be adjusted and made finer or coarser at will. It is fitted with a steel disc and is very durable. The Excelsior Swivel Nozzle is also very useful, as, in addition to the qualities mentioned above, it can be used at any angle.

Many other patterns of nozzles are made by this firm to suit the various classes of machines they make, and to meet planters' requirements. All these are fully described in their price list, to be had on application.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

THE TRAFFIC IN BIRDSKINS AND FEATHERS FOR THE MILLINERY TRADE.

WE are glad to see that leading men on this side who are keenly interested in the preservation of the avi-fauna in the Tropics and elsewhere have joined the Committee for the Economic Preservation of Birds, and are helping the Committee along the way it should go. Under their able help and guidance we hope to see India once more allow the trade to utilize the countless myriads of birds she possesses for the purposes of millinery, the feathers alone, when they suffice, but the whole skin also, if necessary, provided, of course, no risk is incurred of any species being exterminated, or even becoming exceedingly rare.

The Committee had an important field day last month, when the lecture hall of the Civil Service Commission, Burlington Gardens, was well filled, some even going into the gallery overhead, to hear a paper read by Mr. S. L. Bensusan, the well-known author and critic and a member of the Committee, in which he dealt fully with the subject of "The Economic Preservation of Birds." The Countess of Warwick was in the chair, and among the speakers was Dr. Chalmers Mitchell, F.R.S., the chairman of the Committee and Secretary of the Royal Zoological Society, whose head, the Duke of Bedford, wrote Lady Warwick expressing regret at his inability to attend, as did also the Duke of Rutland, who wrote that any scheme of bird preservation, economic or otherwise, interested him deeply. Professor Maxwell Lefroy, best known of entomologists, followed Dr. Mitchell, whilst Mr. Wilfred Mark Webb, Secretary of the Selborne Society, who, with Professor Lefroy, is a member of the Economic Committee, also spoke. Mr. Bensusan's paper was listened to in rapt attention right through, as it deserved to be, for it contained important and useful information based on long experience, and put before the audience in an honest, straightforward manner, in somewhat marked contrast to some speeches and meetings that have been held by the opponents to the trade.

The lecturer clearly showed, what we have all along urged, that it is the march of industrial enterprise, the mechanical dredger and ditcher or the steam plough in the Everglades of Florida, the laying out of estates and extension of towns in the Tropics, rather than the bird-hunter for profit that is driving the avi-fauna of the world from their old haunts and causing them either to shelter in the Garceros of Venezuela or the undisturbed forests of India, Latin America, and elsewhere. Where the Tropics are still unopened the birds are safe from extermination, or if not, the Committee, supported by the trade here, in France, Germany, and Austria, have agreed to "list" such birds and to boycott them altogether. At the close of the lecture some slides of those birds already on the list were shown in the screen, and these are not to be bought or used by the trade. Inquiry on the part of the Committee confirms another statement made by us, viz., that in South America the demand for egret plumes has brought about a measure of protection for the birds from which the plumes are obtained, the great landowners realizing that the dead heron can

only yield what is on its body, whilst the living bird, like the ostrich on a South African farm, will renew its feathers year by year. With birds of paradise life is certainly taken; but then, restrictions have been made throughout New Guinea, where the birds abound, whether Dutch, German, or English territory. This is how it should be. At a semi-public meeting held in November last to denounce the traffic in these and other birds, one of our friends just over from New Guinea, where he had been for eight years or more, told his, in most cases, astonished and unwilling hearers that the male birds of paradise, which are the only ones that come to market, do not reach plumage maturity until they are four or five years old, but that they mate before then. He then informed those present that the best plumaged birds are the old *barren* cock birds that only cause trouble by fighting the younger and still fertile males for possession of the hens. Their removal, therefore, as with the surplus cock impeyans in India, is an advantage from a point of view of economic zoology and the propagation of the species.

The lesson of ostrich farming, the lecturer continued, has much to teach us, for not only has the trade in the plumage of domesticated birds replaced the killing of the wild ones, but the plumes of the tame ostrich are said, by those who know what they are talking about, to be far superior to those of the wild birds, as anyone knowing the knock-about life of a wild ostrich, compared with the care bestowed upon the farmed one, can realize at once. This has caused the trade to develop to such an extent that it is now worth upwards of £2,500,000 a year to South Africa.* As regards total prohibition, as advocated by the fanatics and put into actual practice *pro tem.* in America, Mr. Bensusan reminded those present that the trade in England, though of considerable dimensions, is largely a carrier's trade, the bulk of the material being sent here for re-exportation, mainly to France, which is the chief dealer in the skins and plumage, and her industries in connection with same support more than 50,000 workpeople, and are valued at several million pounds a year. She has refused definitely to send representatives to an international conference, so that the result of a total prohibition plumage Bill passed in the United Kingdom, as a few influential people are agitating for, would be to merely transfer the trade bodily to France, and we know firms on this side, in view of such a thing happening, who have already appointed agents to act for them in Paris.

In conclusion, we want our readers to note the following remarks from this student of economic zoology: "It may be timely to remark that economic preservation, though a comparatively new industry, is not limited to birds. In the United States of America and Canada fur farms have been established with astonishing results. In Siberia, a lecturer at a meeting of the Royal Geographical Society told his audience the other day, the wild maral deer is kept in captivity

for the sake of its horns, which are cut every year, and sent to China to be used in the preparation of an 'elixir of life.' The horns fetch about 40s. per lb., and a deer in captivity is worth about £50. Silver foxes, racoons, minks, martens, otters, beavers, skunks, and musk rats are being preserved in large numbers.† Enormous profits are being made, and everyone is satisfied. The average production of furs from farmed animals in North America alone is estimated to be worth about £5,000,000 per annum, and yet, be it remembered, there is no possibility in the case of these thousands of domesticated animals of anything short of killing, although there has been no suggestion, that I have seen, to the effect that this economic use of fur-bearing animals, that might become extinct if they were not preserved, is in any way blameworthy, and we may reasonably ask ourselves whether, if this can be done with fur animals, why not with birds for their feathers and skins?"

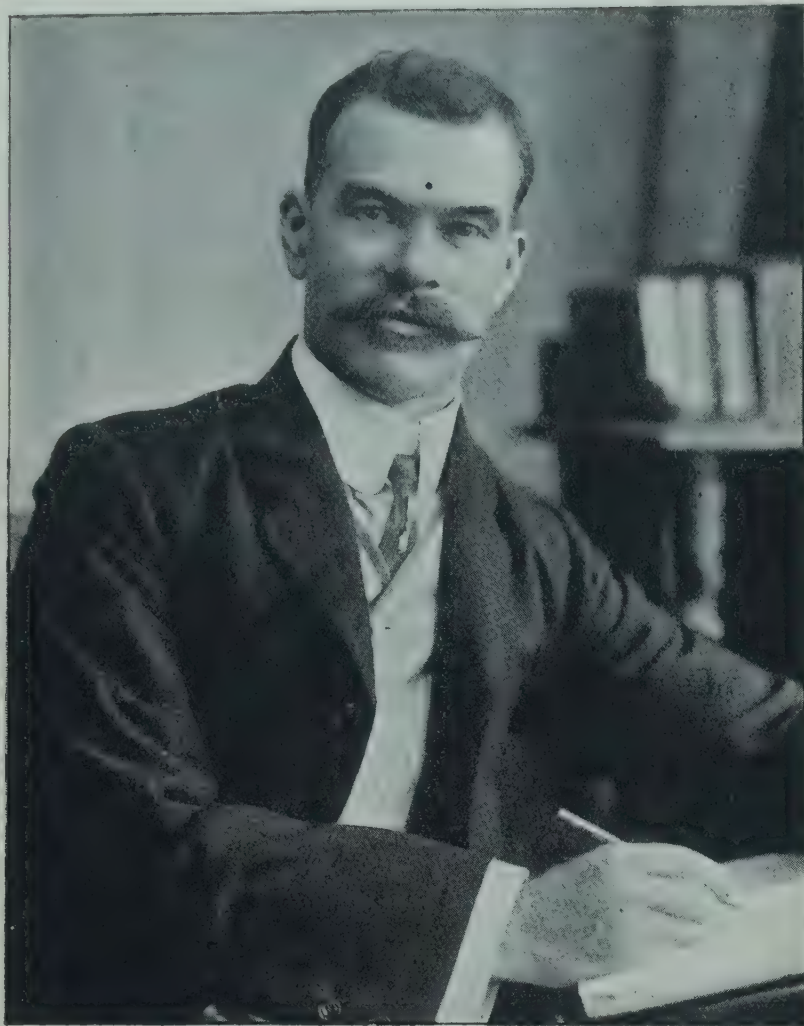
It is speedily becoming apparent, urges the *Madras Mail*, that India may become one of the most prolific of the paper-pulp producing countries of the world. With the assistance of Mr. R. S. Hole, the Forest Botanist, Mr. Raitt, F.C.S., the cellulose expert attached to the Forest Research Institute at Dehra Dun, has compiled a list of eighteen waste grasses in Northern and Central India which, together with bamboos, also a grass, have a certain value from a pulp-making point of view. "Grass cellulose," claims Mr. Raitt, "has features of flexibility, natural spin or twist and felting power which wood-pulp lacks, and is capable of producing a paper second only to that of linen or cotton rag in quality. There are signs that bamboo will become the staple article for the production of paper in India, and it is well suited for at least 50 per cent. of the entire trade."

We cannot do better, concludes the *Madras Mail*, than quote Mr. Raitt's own words as to the scope and effect of the inquiry that he has just completed: "Its chief effect is to give a prospective economic value to the large tracts of land hitherto considered unproductive, and to add to the paper and pulp-making resources of the country a supply of raw material which, in the most conservative estimate, cannot be less than several million tons annually."

THE Minister for the Colonies in France has officially appointed Professor Perrot, of the Ecole Supérieure of the University of Paris, to be the Commissioner-in-Charge of the French Section at the Rubber Exhibition in London next year. Dr. C. Gatin, D.Sc., has been appointed Official Secretary. Monsieur François, Delegate for French Occidental Africa in Paris, will be the Second Commissioner. The French Government are making a large and important display, and, in addition to the products grown in the French possessions, Professor Perrot is organizing a special section for the manufacturing and allied industries.

* The Coonamble ostrich farm, of New South Wales, which is said to be the largest in that State, has now 400 birds, whose feathers are valued at £1,600 a year, or about £4 per bird. The ostrich farming industry appears to be making steady progress, both in the Australian Commonwealth and in the Dominion of New Zealand, so why not establish osprey, pheasant, &c., farms as well?

† This is what we want to see done with chinchillas, vicunas, alpacas, in South America, and sables and other animals elsewhere. Careful preservation will not only avoid extermination but improve the fur, provided, of course, the altitudes, temperatures, &c., of the localities where the farms are situated are conducive to produce the best fur.



"Tropical Life" Friend—No. 105.

MR. H. F. MACMILLAN, F.L.S., F.R.H.S.

Superintendent, Royal Botanic Gardens, Ceylon.

MR. MACMILLAN could, if he wished, truly claim to be known by all sorts and conditions of men. Not long ago, we were told, an illustrated account appeared in *Golf Illustrated* of the popular, picturesque, and much "put-upon" links of the Kandy Golf Club, to which club "Our Friend," is Hon. Ground Secretary. These links were laid out under his direction, from most rugged and unpromising land for "ye olde and ancient game," but thanks to the horticultural training of the Hon. Ground Secretary, the course is now a most desirable one. The golfing world therefore knows "Our Friend" and that is saying a good deal, for nowadays the golfing world seems to include everyone worth troubling about, except the Editor of *TROPICAL LIFE*, who unfortunately has no time for the game. By the way, Mr. Macmillan, though specially interested in golf, also complains of the scanty time that is at his disposal during which he can indulge in its pleasures.

From our knowledge of this Inverness-shire man he has had a better practical, as well as a scientific and theoretical training than most men, for he put in some good years of work on his father's farm, monotonous perhaps at the time, but which have, we feel sure, proved extremely useful to "Our Friend" since. In all probability, the Kandy Golf Course is the better for those years of training, as it is not every man who can make good golf links out of rough land.

Inverness, later on, lost its son, who migrated south, and entered the Royal Botanic Gardens at Kew, as a student, with a view to qualifying for a botanical appoint-

ment abroad. There he attended the various courses of lectures, with sufficient profit to his knowledge to enable him to secure certificates in all the subjects taught, as well as to win a prize in 1894 for an essay he wrote, whilst his prize-winning collection of British dried and classified plants, went to form the nucleus of a student's British Herbarium at the Gardens.

Outside Kew, "Our Friend" attended a course of anatomical and physiological botany under Prof. Farmer, at the Imperial College of Science, South Kensington. Transferring his attention to Ceylon, where he was appointed, in 1895, curator of the well-known Botanic Gardens at Peradeniya, he has carried out extensive improvements and developed new features there, whereby out of a part of the gardens was formed an extensive floricultural section which, it is claimed, is now the most attractive and most popular resort in these famous gardens.

As Secretary of the 1912 All-Ceylon Exhibition, the largest ever held in that island, Mr. Macmillan received a gold medal in recognition of the valuable services he rendered to help make the exhibition the success that it was; now under Mr. Lyne as Director of Agriculture, the services of "Our Friend" have been further recognized by his being appointed to succeed Dr. Lock, resigned, as Chief of Botanic Gardens.

Like ourselves, Mr. Macmillan is a great believer in the utilization of dynamite or other explosives for agricultural purposes. He has recently completed an illustrated bulletin on "The Use of Explosives in Agriculture," which we noticed received considerable notice in the Press at the time, and is doubtless enjoying a wide-spread circulation.

Author of numerous pamphlets and bulletins on horticultural, agricultural, and botanical subjects, including "Notes on Ceylon Botany," "Illustrated Guide to the Royal Botanic Gardens, Peradeniya" (an elaborate publication now in its second edition); Mr. Macmillan undoubtedly gained most prominence as author of the now well-known "Handbook of Tropical Gardening and Planting," of which the first edition, like our book on "Coco-nuts," ran out in ten months, the Government of Ceylon, among others, having purchased a large number of copies. The first edition exhausted, a second and enlarged one has been issued and copies, if not already on the move, will soon be available. The new book will have 650 pages or more and over 300 illustrations.

Those who, like ourselves, believe in planters raising vegetables to provide fresh and healthy changes of food for their tables, and flowers to please the eye, both inside as well as around even a bachelor bungalow, are glad to have such a man as Mr. Macmillan in the Tropics, for whilst he does excellent work on purely commercial lines, he still finds time to look after our health, please our eyes and elevate our tastes and desires with his books and writings on gardening, both floral and vegetable.

"BRAZIL, and especially the Amazon country, has sustained a serious loss in the death—which occurred on February 18th—of Dr. Jacques Huber, Director of Goeldi Museum and Botanical Garden, Pará," reports the *India-rubber World*. We greatly regret to hear the news and so, we are sure, will everyone else.

Business Notices.

- 1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.
- 2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.
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- 4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.
- 5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.
- 6.—Changes of address should be promptly notified.
- 7.—Non-receipt of copies of the Journal should be notified to the Publishers.
- 8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

MARCH, 1914.

The Manuring of Mealies.*

By A. GORDON HOWITT, B.Sc.

THE mealie crop has always been a source of admiration to anyone who has not been brought up in the districts where it grows. Sir John Lawes, founder of the Rothamsted Experimental Station, in expressing his regret at not being able to visit America, referred to the mealie as "the most superb crop that grows, as it is, in itself, the most valuable." And so on such lines the tribute to the mealie as "the most superb and most valuable crop" is fairly universal.

Between the mealie crop and any of the other grain crops, such as wheat, there are several important points of difference which have much to do with the manuring treatment of the mealie crop. The first point to consider is the analysis of the plant food removed by an average harvest of mealies. A crop of ten bags of shelled mealies per acre, including the stalks, removes on an average:—

55 lb. nitrogen,
20 lb. phosphoric oxide,
40 lb. pure potash.

Compare this with the analysis of wheat, and at the first glance the mealie crop appears to be a very exhaustive crop indeed. For a long time the mealie was considered to have the same property as the legume family of plants in its ability to fix and make use of the nitrogen in the air. Peas, beans, and lucerne belong to the legume family of plants, and

everyone knows that these plants have on their roots special organisms which fix and convert the nitrogen in the air into suitable plant food. It has since been proved, however, that the legumes are the only family of plants that can do this. Yet how can we explain the heavy yields of mealie stalks and cobs which remove annually about 55 lb. of nitrogen where no readily available nitrogenous manures have been supplied? The explanation is fairly simple. The mealie is planted at the commencement of the growing season, after the summer rains have fallen. The young plant is thus able to develop a very vigorous root system, and the climatic conditions are very favourable for the change of all kinds of plant food found naturally in the soil into available forms. Especially is this the case where the soil contains a fair amount of humus or organic material, and even where mealies follow mealies year after year a good deal of humus is supplied by ploughing under the stalk residues, in addition to the weeds and grass which spring up during the last month or so that the mealie stands on the ground. Hailstorms do much damage in the mealie districts, but they are capable of doing good indirectly, for they bring to the soil a fair amount of nitrogenous plant food. The electric discharges which usually accompany hailstorms cause the combination of the nitrogen and oxygen in the atmosphere, and this increases the supply of soluble nitrates in the soil. Now wheat, on the other hand, is sown during the cool months of the year, and at that time the soil conditions are not so favourable for converting the humus into soluble plant food. Besides, the root system is not so vigorous, and consequently the rootlets of the wheat have not the same power to "range" or make use of the plant food in the soil as the more vigorous rootlets of the mealie. Therefore, the supply of readily available nitrogenous manures must be considered for wheat and other grain crops, but for mealies this can usually be left out of the question. In support of this we shall quote the average returns from a four years' experiment at Cedara on a red friable ironstone loam:—

Plot	Average per acre for 4 years		Average gain over no manure		Value of increase		Average cost of manures		Profit
	lb.	...	lb.	...	s. d.	...	s. d.	...	
1 ... No manure	342	...	—	...	—	...	—	...	—
2 ... K.P.N.	1,692	...	1,350	...	67 6	...	23 6	...	44 0
3 ... K.P.	1,676	...	1,334	...	66 6	...	15 6	...	51 0
									(loss of
4 ... K.N.	353	...	11	...	0 6	...	15 3	...	14 9)
5 ... P.N.	1,355	...	1,013	...	50 6	...	16 6	...	34 0
6 ... Supers	1,293	...	951	...	47 6	...	8 6	...	39 0
7 ... Slag	1,417	...	1,075	...	53 9	...	7 3	...	46 6
8 ... Bone meal	1,599	...	1,257	...	63 0	...	14 6	...	48 6
Explanation of letters	K.	...	100 lb. muriate of potash per acre.						
	P.	...	300 lb. superphosphate.						
	N.	...	170 lb. sulphate of ammonia.						
	Slag	...	300 lb. per acre.						
	Bone meal	...	300 lb. per acre.						

Another experiment was carried through on the same lines as above, but instead of applying a mixture of 300 lb. of superphosphate, 170 lb. sulphate of ammonia, and 100 lb. muriate of potash, a mixture of 300 lb. basic slag, 224 lb. nitrate of soda, and 100 lb. muriate of potash was used as a dressing of the complete manure. The results practically confirm the above returns, and have consequently not been

* The appearance of Mr. Burt-Davy's book, reviewed on p. 54, in which the question of manuring is fully discussed, makes the appearance of this article most opportune.

included here. There are two points very noticeable in these results. The soil is obviously very deficient in phosphate, and a mixture of phosphate and potash gives a more profitable return than the same mixture with the addition of nitrogen. Mr. Sawyer, in the "Cedara Memoirs," sums up the results of all the manuring experiments carried through from 1902 to 1906 in the following words: "The experiments then have shown conclusively that for maize growing the primary need of this soil is phosphoric oxide, the next is potash, and that, for the present at any rate, the artificial supply of nitrogen is unnecessary."* This forms the basis of the recommendation of the Natal Farmers' Co-operative Union, but generally in the mealie districts the manure mixture

in common use is a combination of superphosphate and bone meal. Now this mixture does not supply any potash, and if we look at the Cedara results it will be observed that the addition of 100 lb. muriate of potash to the 300 lb. superphosphate increased the profit from 39s. on plot 6 to 51s. on plot 3—i.e., a net gain of 12s. per acre. Perhaps a better illustration of the value of potash is given by the results from p. 128 of vol. i, "Cedara Memoirs":—

	1902-03 Grain	1903-04 Grain	1904-05 Grain	1905-06 Grain
Nitrogen, phosphate and potash ...	905 lb. ...	1,006 lb. ...	849 lb. ...	2,075 lb.
Nitrogen, phosphate, no potash...	813 lb. ...	935 lb. ...	573 lb. ...	1,285 lb.
Gain due to potash ...	11·3 %	7·6 %	48·2 %	61·5 %

These results are very instructive. In the first two seasons the mealie could depend on some of the natural potash in the soil, but for the third and fourth seasons this supply was practically exhausted, and consequently the gain due to potash was very conclusive. This gain due to potash was only recorded in the extra weight of the shelled mealies, for the yield of stalks and cobs and refuse grain remained very uniform throughout the four seasons. From this we take the opportunity again to emphasize the fact that the effect of potash on any cereal crop is far more noticeable on the size and quality of the grain than on any increase in the bulk of straw or stalk. The main function of potash is in the formation of starch, and farmers who wish to produce a nice clean type of mealie of first-class quality must insist on having a good percentage of potash in their manure mixture.

We shall now discuss briefly the question of the selection of a suitable manure mixture. We must always keep in view the practical side of the question. The value of the crop obtained must in every case

exceed the labour expenses, the rental of the land, and a reasonable return on capital expended. Otherwise the game is not worth the candle. For mealies, bone meal is a very useful base of any manure mixture. Bone meal is certainly slow in action, but under Natal conditions of summer climate and rainfall it is not so slow as many believe. We must bear in mind that bone meal is now supplied in a very finely ground condition, and consequently the plant food in bone meal comes fairly quickly into usefulness. The mealie seedling, however, has a critical stage in its life, i.e., just when the food in the seed has been exhausted, and before the small rootlets have developed sufficient vigour to pick up the food supply in the soil. Phosphate is

the principal food required at that critical time, and consequently we recommend that superphosphate should be added to the bone meal. The readily available plant food in the superphosphate can be easily taken up by the young rootlets, and a more vigorous mealie plant can usually be produced. Then finally a suitable quantity of potash must be added so as to assist in the later development of the mealie, thereby ensuring a larger return of first-class quality

of grain. With these points in view we can confidently recommend the following mixture:—

"A" MIXTURE.

1,250 lb. bone meal,
500 lb. superphosphate,
250 lb. muriate of potash.

Making in all 2,000 lb.

Here the superphosphate gives the initial start to the mealie; by that time the bone meal comes into action, and the potash produces a nice clean type of mealie. A dressing of 200 lb. per acre of this mixture would be sufficient, and this would cost about 13s. 6d. per acre. Now, one and a half bags of shelled mealies will cover this outlay, and this leaves a sufficient margin for other expenses. From the above remarks this combination of superphosphate and potash with bone meal has much to recommend it. The bone meal counteracts any bad effects from the acid condition of the superphosphate, and as its plant food becomes gradually available, the mealie plant receives the necessary nourishment throughout its entire period of growth. The fertility of the soil is thereby built up, and even with heavy rains there is no danger of any of the plant food being washed out of the soil.

Some farmers have had bad experiences by the use of superphosphate alone, and consequently they always prefer basic slag. In the revised edition of a recent



The advantage of manuring mealies. Note the increased yield on the left.

* See footnote on p. 53.

pamphlet, copies of which were distributed gratis on application, the author went fully into the difference between superphosphate and basic slag. The Cedara experiments carried through on an ironstone loam are clearly in favour of a mixture of slag and potash, but then an ironstone loam is peculiarly adapted to slag, and for soils of this type we should never recommend superphosphate. The following mixture with basic slag can be confidently recommended, applied at the rate of 200 lb. per acre:—

SLAG MIXTURE.

1,000 lb. basic slag,
750 lb. bone meal,
250 lb. muriate of potash.

In all 2,000 lb.

As proof of the good results from rational manuring on the lines which we have suggested, we shall quote the returns from a manuring experiment carried through this season by Mr. Allsopp, Cato Ridge, Natal. The soil on the plots—one acre in extent—was of a very uniform character. Mealies had been grown for the past few years with an annual dressing of bone meal, and this residue accounts for the fairly high yield from the “no manure” plot. The results are as follows:—

Manures applied to each Plot.

Plot 1—No manure.

Plot 2—100 lb. bone meal; 100 lb. supers.; no potash.

Plot 3—125 lb. bone meal; 50 lb. supers.; 25 lb. muriate of potash.

Plot	Yield shelled mealies		Increase over no manure		Value of increase		Cost of manures		Net profit	
	lb.	bags	lb.	bags.	s.	d.	s.	d.	s.	d.
1	—	2,000 10	—	—	—	—	—	—	—	—
2	No potash	2,500 12½	500 2½	—	25	0	10	3	14	9
3	With potash	3,100 15½	1,100 5½	—	55	0	13	4½	41	7½

Here then we have proof of the advantage of rational manuring and also of the benefit of including a fair percentage of potash in any manure mixture. Last season in the mealie districts of Natal something like 5,000 acres were treated with the manure mixture as applied to Plot 3, and as a result, those farmers who consented to make a small trial last season have placed orders for larger quantities this season. This is the best tribute to the real value of any manure, and it is with the utmost confidence we recommend mealie growers to make trials either with the “A” or slag mixture.

* Against this statement of Mr. Sawyer, which somewhat surprises us, our notes of the latest work done in connection with manuring maize, the result of experiments carried out in 1911 and 1912 by the Egyptian Department of Agriculture (circulars No. 22 and 43) conclusively show that the use of nitrogen on the maize crop is very advantageous. We say this because, whilst no fewer than 110 trials were carried out in these two years with nitrate of soda, applied at the rate of 300 lb. per acre in two dressings, the average increase per acre in the number of ears was 10 per cent., and in the weight of the ears 20 per cent., while the additional nett profit averaged over £4 per acre. In the United States of America it has been proved beyond doubt that nitrogenous dressings are essential if good crops are to be obtained. The periodical reports all show the advantages of nitrogen as an ingredient with the other plant foods,

The Coming International (London) Rubber Exhibition.

WE are informed by Mr. Manders that, besides the silver cups to be offered by the Rubber Growers' Association for competition by estate superintendents or assistants, three cups are further offered in connection with the above, to go to the exhibits that are placed highest by the judges, viz:—

Mr. John McEwan's cup, for the best exhibit, wherever produced.

Mr. Thos. North Christie's cup, for the best exhibit produced in Ceylon.

Mr. E. L. Hamilton's cup, for the best exhibit produced in the Federated Malay States or Straits Settlements.

Only one cup will be given to any prize-winner, and should the highest award be made to an exhibit from Ceylon or Malaysia, Mr. Christie's or Mr. Hamilton's cups respectively will go to the next highest from the same producing area. The cups are to be personal awards to the superintendents or estate assistants actually responsible for preparing the successful exhibits.

In the event of any dispute as to the actual responsibility for the work done, the Exhibition Committee will refer the question to a visiting agent in the district, whose decision shall be final.

No entry is required, but it would be advisable for those who are actually responsible for preparing exhibits in Competition No. 1 to have their names sent forward and their responsibility admitted in a definite manner.

THOSE of our readers and exchanges who use the Aerograph spraying apparatus, either for drawing, designing, or painting, should note that the manufacturers have made some substantial reductions in the cost of their sprays.

Coffee Oil.

MESSRS. SCHIMMEL AND Co., in their semi-annual report for October, 1913, report that Messrs. G. Bertrand and G. Weisweiler have identified pyridine as being a constituent of the essential oil of roasted coffee beans. From 5 kilos of ground, freshly roasted beans, the authors obtained by distillation with water from 1 to 2 c.c. of a volatile oil possessing the aroma of coffee, but having at the same time an odour of amylalcohol, furfural and pyridine. For the purpose of identifying the base, the latter was extracted from the oil by treating it with hydrochloric acid. The aqueous solution of the hydrochloride of the base, when barium silicotungstate was added to it, afforded the characteristic pyridine silicotungstate. Moreover, the base, when recovered from the tungstate, and boiled with aqueous platinum chloride solution, afforded the platinopyridine salt $(C_5H_5N)_2PtCl_4$, which is almost insoluble in water. Both the tungstate and the platinopyridine salt were successfully analysed.

It would appear as if coffee oil, when once the pyridine has been removed from it, no longer possesses the true aroma of coffee.

Agriculture in Tasmania

WE have perused the yearly report of the Director of Agriculture to his Government with great interest. The report covers the period from July 1st, 1912, to June 30th, 1913.

One thing we are glad to notice is that a new Fertilizer Act has just come into operation. Little is said of it as regards detail, but the Director states, "This will undoubtedly prove beneficial to every man on the land . . . as every bag of fertilizer sold must have a label attached to it showing clearly what it contains, and the information so given is a warranty."

In these days of commercial fertilizers an Act of this sort is an absolute necessity for the protection of the cultivator. We have not the space to comment on all the numerous points of interest dealt with in the report, but we would allude to one important feature which especially attracted our attention, viz., the question of pasture land. We are accustomed to look upon our Australasian colonists as essentially progressive in their ideas, and it comes therefore as something of a shock to find that the Director has to lecture the farmers on their failure to recognize the fact that grazing land cannot be depleted year after year of its essential plant foods without injury, and that these plant foods must be replaced if the stock carrying capacity is to be maintained; in other words, that the grass land must be "farmed."

We thoroughly agree with all the Director says on the point, as it is an undoubted fact that land which is down to grass seldom receives the attention it deserves. Too often it is thought that when under grass the soil requires no treatment, but it is becoming more and more recognized that the application of fertilizers is essential both for grazing and mowing land. It is well known that to ensure a good quality herbage, phosphates and potash are necessary, while to ensure a vigorous growth nitrogen must be added; in no case should lime be omitted where it is lacking in the soil.

It is easy in most cases in these modern days to procure the necessary plant foods in a form easily and quickly assimilable by the plants, and at comparatively small cost. It is surely worth the while of the stock raiser to be able to spend a little money not only to increase the stock carrying capacity of his land, but to accelerate the growth of the herbage by two or three weeks by a moderate dressing of soluble phosphates, and some quick acting nitrogenous fertilizer such as nitrate of soda.

What we have frequently urged in these pages in regard to the treatment of the grain crops of the world applies equally to the breeding of stock. In each case the full capacity of the soil must be utilized, for it is certain that with a reasonable amount of care, and at a small cost, the greater part of the available land in the world can be made to yield double the present crops, and the grazing land to carry twice the amount of stock.

Such results are by no means impossible, and, indeed, some such happenings there must be within a measurable distance of time unless the world is to sit up quietly and starve, and it is hardly likely to do that.

Reviews.

MAIZE—ITS HISTORY, CULTIVATION, HANDLING AND USES. By Joseph Burt-Davy, F.L.S., Government Agrostologist and Botanist, Union of South Africa. 831 pp., with Frontispiece (Portrait of General Louis Botha, P.C., Prime Minister and Minister for Native Affairs, South Africa) and 245 illustrations. Price 25s. net, or 26s. 6d. post free. Longmans, Green and Co., 39, Paternoster Row, London, and at New York, Bombay, and Calcutta.

THIS is hardly a book one could put in the coat pocket and pretend it was comfortable. It weighs fully 4 lb., but that is not an ounce too much. We have always wished for such a work, and now ask for a similar one on tobacco-planting.* Both are badly needed, and the industries, we would maintain, have not taken those strides forward that they could and should have done had such a book as Mr. Burt-Davy offers us on maize been given to the world two or three years ago; we trust the sister book on tobacco may soon appear from somewhere, and that as experienced an authority on tobacco as Mr. Burt-Davy is on maize should be the author.

Whilst referring more especially to South Africa, the work under review will appeal to maize growers and shippers, even to maize buyers and consumers for trade purposes as well, whilst students and instructors alike interested in its culture will hasten to purchase it, or, if they are beginners, to save up the pence and cents to buy it with as soon as possible.

Maize, we are told, is a white man's crop, but whilst we agree that maize can well be cultivated over vast areas by white labour, and that such men could increase their output, we would add a word for the ear of those who are not quite so extreme on the "White Man Theory" as our good friends in South Africa, and urge them to most carefully study this book with a view, perhaps, of introducing new varieties of maize into their districts for cultivation by coloured labour, in all or any part of the world where maize will yield well. Furthermore, we believe it is a fact that many centres, West Africa as much or more than anywhere, possess varieties of maize that are extremely valuable as crop yielders, and which, therefore, cannot be too carefully preserved, increased, and distributed round lest the unheeding natives, ignorant or indifferent of the angel they are entertaining unawares, should sell out or consume all that they have gathered, and so cause the variety to become extinct through not keeping sufficient seed-corn to plant out for the next season's crop.

We have not nearly enough space at our disposal to do justice to the book, but would call attention to the following sections in reference to the above remarks: Chapter V: (a) Necessity for Improvement; (b) Inheritance of Characters; (c) Methods of Plant-breeding. Chapter VII: Varieties and Breeds. Those outside Africa who care to study these sections would be certain to find many "wrinkles" as how to improve their present output, both in quality and quantity, whilst all will closely study the chapters on Soils and

* On p. 360 the author discusses rotation crops in which maize follows tobacco, cotton, and a leguminous crop.

Manure;* Tillage, Planting, and Cultivation;* Diseases and Pests; Harvesting and Storage, plus the pests attacking stored maize; Buying and Selling (covering pp. 498-627, and including prices, elevators, dryness, grading, freights, silos, &c.); Milling and Chemistry; Maize as food for man and beast, as green fodder and as a raw material for the factory. As in our own book on "Coco-nuts," nothing to do with the subject seems to have been omitted. Big white planter and small settler alike, provided he can read the book, will find it explicit, reliable, and generally invaluable.

COCO-NUT CULTIVATION; with some Notes on Plantation Machinery. By H. Lake Coghlan and J. W. Hinchly. 128 pp., including index, 10 full-page illustrations and various diagrams. Price 3s. 6d. net. London: Crosby, Lockwood and Son, 7, Stationers' Hall Court, E.C., and 5, Broadway, S.W.

Those needing a small handbook on coco-nut cultivation will find the above most useful. Weighing only 10 oz., it can accompany the owner on his journeys when its contents will cause him to often refer to it for advice. Like every other book we have seen on the industry this work quotes a portion of Sir Wm. Lever's Foreword to the first edition of our book, and then goes on to discuss yields of 10 nuts for six-year-old trees and 50 nuts for ten-year-olds, with copra at 4,000 nuts to the ton. In the restricted space at their disposal the authors have certainly brought together a great deal of information, useful and reliable. When clearing the land before planting "there ought not to be any question as to the advisability of rooting up all tree stumps," we are told on p. 22. "What is really wanted is an Agricultural Bank," we are pleased to see on p. 11. Hear! Hear! Hear! we say to this, whether for Trinidad (W.I.), Malaya, or elsewhere, where these necessary and most useful institutions (if well managed) should be made compulsory on the Governments to establish. On this point it will be remembered that Sir William Lever in his Foreword to the first edition of our book also pleads for, or urges, that financial assistance be given to coco-nut planters. "I see no reason," he tells us, "why the various Governments affected should not give financial encouragement to the establishment of coco-nut estates by helping the planter over the period which elapses before the plantation comes into bearing. If this were done it would open up tropical possessions in a way that we can scarcely realize." Perhaps future writers on coco-nut development will refer to this Foreword and give as much prominence to this question of financing producers as they have done so unstintedly to that paragraph which puts coco-nuts first among the world's productive investments. A sentence of Mr. Coghlan's that interested us greatly, and which we were glad to see, will be found on p. 8: "Some London rubber agencies have as many as 100 applicants, mostly public school boys, waiting for a vacancy to occur out East; men now recognize that the old professions in England are played out." We hope all these young fellows get their berths, and having served a term under good masters will make a bid for fortune on their own account, as suggested on the first page of this issue, for by such means, and such means alone, can we expect to increase and spread out our trade and commerce.

* Fertilizer manufacturers and plough engineers will find much that is useful in these sections.

"Tropical Life" at the Play.

LYDIA YAVORSKA IN TOLSTOY'S "ANNA KARENINA."

IF, as everybody seems to agree is the case, it is as great a pleasure to hear Sarah Bernhardt speak French as to watch her acting whilst she speaks it, it is equally pleasurable to listen to Madame Yavorska speak English on the stage, especially in such a character as the heroine from Tolstoy's book "Anna Karenin or Karenina." Those who, like ourselves, have followed Madame Yavorska's career will remember that she has been to London at least twice before, when she achieved pronounced successes in Ibsen's plays as well as those by other authors, including three (Princess Nelly, in "The Great Young Man," Nadia in "The Dance of Life," and Xenia in "Boris Godunov") by Prince Bariatinsky. We do not remember her ever being billed on this side of the channel to take the part of the Duc de Reichstadt in "L'Aiglon," but have heard that she is as "great" in that as in Anna Karenina; if this is so it must be a real pleasure to watch Madame Yavorska as the Eaglet. The marvel about this actress is her ability to perform in French, German and English, as well as Russian, which, we take it, is her mother tongue, although Madame Yavorska (or Princess Bariatinsky as she is in private life) is of French Huguenot extraction; but then perhaps it is as Vilbouchevitch told Dr. Soskin and the writer in Paris (the first and only time we all met, when we congratulated him on being able to talk some eight languages and translate four more), Russian is so intricate that once you can master that you can learn anything. Be this as it may, it is a real pleasure to hear Madame Yavorska speak English, and her decidedly foreign accent (we suppose Russian, since it is not exactly French or German) only lends emphasis to the character she portrays as Anna Karenina, whether happy or sad, very gay or intensely torn by anguish between parting from her little son Serge, and her lover Alexis Vronsky; right through the play it was the same, whilst her acting is truly wonderful; grief and laughter comes so naturally to her; but, as with all Tolstoy's heroines, there is more grief than joy, and Anna up to the time that she is overtaken by the fate that she has always so dreaded, which compels her to hurl herself under the train, suffers severely. In this case the train was only bearing Alexis away for a brief space—two hours at the most—but this, her overwrought mind made her believe was but the beginning of the—of her end, and perhaps she was right, for many of her enemies were with Alexis.

Those of our readers, therefore, who find themselves in the same town as Madame Yavorska will do well to go and see her. In these days of easy travelling and international congresses, planters and tropical agriculturists come and go all over the world, and if it is to discuss cotton planting in Russian territory, selling tea, coffee or cacao to St. Petersburg or Moscow, or whilst attending a congress in Berlin, London, or Paris, if Yavorska is acting go and see her; her acting and the plays she chooses are a pleasure and revelation to anyone capable of appreciating them, whether in the New Theatre at St. Petersburg, in Warsaw, Vienna, at the Antoine Theatre, Paris, or at the Ambassadors in London, where with Mr. Maurice Francis as her acting manager we had the pleasure of seeing her act in Tolstoy's play as Anna Karenina.

Cotton.

THE following were the prices for Cotton in London on March 5th, according to Messrs. Slann and Davies :—

		Good—Fair.		Good.		Fine.		Superfine.	Good, 1913.		Good, 1912.		per lb.
		d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds *	...	5 $\frac{1}{4}$	to 5 $\frac{7}{16}$	5 $\frac{1}{2}$	to 5 $\frac{7}{8}$	5 $\frac{3}{4}$	to 6 $\frac{3}{16}$	—	6 $\frac{1}{8}$	to 6 $\frac{5}{16}$	5 $\frac{1}{4}$	to 5 $\frac{7}{16}$	—
Madras	...	5 $\frac{7}{8}$	to 6	5 $\frac{1}{8}$	to 6 $\frac{1}{4}$	—	—	—	5 $\frac{1}{16}$	to 6 $\frac{5}{8}$	5 $\frac{1}{8}$	to 6 $\frac{1}{16}$	—
Bengal	...	—	—	4 $\frac{3}{4}$	—	5	—	5 $\frac{1}{8}$	5 $\frac{5}{8}$	—	4 $\frac{7}{8}$	—	—
Assam	...	—	—	5 $\frac{5}{16}$	—	5 $\frac{11}{16}$	—	5 $\frac{1}{16}$	5 $\frac{7}{8}$	—	5 $\frac{3}{8}$	—	—
China	...	—	—	5 $\frac{1}{2}$	—	5 $\frac{1}{16}$	—	6 $\frac{1}{8}$	6	—	5 $\frac{1}{2}$	—	—
West Indian	...	7	—	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{4}$	7 $\frac{3}{4}$	—	7 $\frac{1}{2}$	—	—
Sea Island	...	11	—	14	—	17	—	20	15	—	13 $\frac{1}{2}$	—	—
West African	...	6 $\frac{9}{16}$	—	6 $\frac{1}{16}$	—	7 $\frac{3}{16}$	—	—	6 $\frac{1}{2}$	—	5 $\frac{1}{16}$	—	—
East	..	6 $\frac{7}{8}$	—	7 $\frac{3}{4}$	—	9 $\frac{1}{2}$	—	—	7 $\frac{5}{8}$	—	6 $\frac{1}{16}$	—	—

* Liverpool quotations.

The demand on the spot was very moderate during the first week in March; but improved on the 5th. Middling American is 6 points lower. "Futures" have been adversely affected by the proposed new legislation in America with regard to the form of contracts and selling in connection with Egyptians. The quotations on balance, after to-day's slight recovery, show a decline of about 9 points for near and about 6 for distant. East Indian is attracting some attention, and there has been more doing at easier rates.

The import into Liverpool this week amounts to 143,442 bales, since September 1st 3,269,688, same week last year 79,094, last year's total 3,570,582 bales. The estimated Sales amount to 51,000 bales, including "called." Middling American is quoted at 6·99d. per lb., last year 6·82d., 1912 5·99d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight	12,514,000	11,869,000	13,026,000	bales
Exports from United States since September 1st—				
To Great Britain	2,659,000	2,916,000	3,241,000	—
To Continent, &c.	3,908,000	3,578,000	4,339,000	—
Total crop	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	March 5th.	Same time 1913.	Same time 1912.	
March	6·61 $\frac{1}{2}$	6·54 $\frac{1}{2}$	5·81	per lb.
Mar.—April	6·61 $\frac{1}{2}$	6·54 $\frac{1}{2}$	5·81	—
April.—May	6·56 $\frac{1}{2}$	6·54 $\frac{1}{2}$	5·81 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

No East India was catalogued for sale at the beginning of March, but the market has been well supplied with Costa Rica and other Central American descriptions. The demand generally has been slow, and values ruled in buyers' favour. Colombian was rather easier, and only a small proportion of the Dumont Santos offered was disposed of. At the close there was an improvement in the demand and sales went quite steadily. The stocks in the principal ports of Europe on March 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 121,000 bags, against an increase of 176,000 bags last year; the visible supplies show a decrease for the month of 474,000 bags, against a decrease of 710,000 bags in 1913. "Futures" have been an irregular market; at the opening the tone was firm on better Continental advices and a smaller estimate for the next Santos crop, but the visible supplies on March 1st being considered rather unfavourable the advance was lost, and for the week May Santos is 3d. lower. We quote :—

	To-day	Feb. 26th, 1914
London ... Santos, May del.	42s. 4 $\frac{1}{2}$ d.	42s. 7 $\frac{1}{2}$ d.
New York ... No. 7, Rio	8.83 cents	8.95 cents
Hamburg ... Santos	48 pf.	48 $\frac{3}{4}$ pf.
Havre ... Santos	59 $\frac{1}{4}$ francs	60 $\frac{1}{4}$ francs

The receipts at Rio and Santos from July 1st, 1913, to March 4th, 1914, were 12,041,000 bags, against 10,123,000 bags and 10,802,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

Mocha.—At 82s. to 82s. 6d. for longberry greenish.

Sumatra.—At 73s. 6d. to 81s. for medium to good bold Liberian.

Uganda.—54s. to 56s. for ordinary, 64s. 6d. to 67s. for low middling, 74s. 6d. to 75s. for bold.

Nairobi.—At 56s. for smalls, 80s. for bold.

Nyasaland.—At 44s. to 53s. 6d. for common to fair smalls.

Jamaica.—At 73s. for low middling, 80s. for bold.

Costa Rica.—At 54s. to 72s. 6d. for ordinary to good smalls, 61s. 6d. to 68s. 6d. for ordinary to fine ordinary, 69s. to 79s. for fine fine ordinary to good middling, 72s. to 87s. 6d. for low middling to fine bold.

Guatemala.—At 54s. to 63s. for ordinary to fair smalls, 66s. 6d. to 73s. for fine fine ordinary to good middling, 73s. to 79s. for bold, 98s. 6d. for Maragogipe.

Salvador.—At 69s. for smalls, 72s. for good middling.

Vera Paz.—At 63s. to 82s. 6d. for fine ordinary to good middling, 80s. 6d. to 96s. 6d. for fair to fine bold.

Colombian, &c.—At 63s. to 72s. 6d. for fine fine ordinary to good middling, 70s. to 81s. 6d. for bold.

Dumont Santos.—Unwashed at 47s. 6d. to 48s. for smalls, 61s. 6d. to 62s. for bold.

Sugar.

MESSRS. C. CZARNIKOW AND CO., LTD., writing on March 12th, said that future prospects with sugar, given normal weather in Europe, somewhat depends upon Cuba; more sales have been made during the last eight days to Europe, and the quantity anticipated in our table of statistical prospects is probably nearing completion. Whether Cuba will want to sell larger quantities remains to be seen, and that depends on the size of the crop and storing capacities, which no doubt have been increased. During the next two months, however, the weekly production exceeds probable shipments, and the low level of prices is the one reassuring feature in the situation, as well as the certainty that during the summer and autumn America will be dependent on Cuban sugars alone, which are at present selling at the parity of 8s. c.i.f. for Javas, and 6s. 9d. f.o.b. 88 per cent. Hamburg. They would bear even the expensive storing charges in New York if holders act reasonably. Meanwhile, a further decline from 9s. 3¼d. to 9s. 1¼d. for May beet was caused this week by large Cuban receipts and lower quotations from America, where sales were made from 3.01 to 2.95 cents, equal to 9s. c.i.f. New York, or 9s. 3d. to 9s. 4½d. c.i.f. Europe, according to destination and delivery. Refiners here, after paying those prices, refused to go on, though they are cheaper than beet, but the refined trade remains very slack. Lyle had to reduce his price by 3d. per cwt., and the Board of Trade figures printed below show that 57,500 against 34,400 tons British refined were in bonded stocks on March 1st. But the total deliveries in February were not inferior to the moderate figures of last year, and during the present month they may be even slightly better, unless duty payments get curtailed again by the proximity of the Budget, which every year interferes with business.

The American market has further given way under the pressure of Cuban offers, and the quotation for Centrifugals has relapsed from 3.01 to 2.95 cents = 9s. c.i.f. New York. In Cuba there are 174 factories at work against 174 last year, otherwise from cane-producing countries there is no fresh news to report. At the decline more interest has been shown by buyers.

In the United Kingdom refining grades of cane sugar have been quiet, and prices are rather easier. There are sellers of Cuban Centrifugals at 9s. 3¼d. c.i.f. United Kingdom. Grocery Crystallized has again been a very dragging market, and only a very small business has taken place at steady rates to 3d. decline. Low brown sugars are offered at slightly lower prices. Actual sales include only very small quantities of British West India, which changed hands at previous rates to 3d. decline, whilst 494 bags Demerara Syrups sold at 10s. duty paid for dark brown, 10s. 6d. for fair brown, and 11s. 6d. for middling soft yellow.

About 1,000 bags low yellow to good middling greyish yellow Crystallized Surinam realized 13s. to 13s. 4½d. duty paid.

In Liverpool, about 9,400 bags grainy Peruvian sold at 10s. 1½d. and 10s. 9d.; Syrups at 8s. 7½d. to 9s. 3d. quay terms telquel.

The India-rubber Market.

Up at Liverpool the Pará market was quiet, but fairly steady during the early part of this month, values on March 7th closing: Hard fine spot, 3s. 0¼d.; March-April, 3s. 0½d.; April-May, 3s. 0¾d.; and May-June, 3s. 1d.; soft fine, March-April, 3s.; Peruvian Ball, 1s. 10½d.; and scrappy Negroheads, 1s. 9¾d. per lb. Medium Brazilian grades have been more or less idle, with small sales of Pernambuco scrap at 1s. 0½d., Manicoba at 1s. 1½d. to 1s. 9d., and Mangabeira at 1s. to 1s. 0½d. per lb. The African market has been steady, and the sales reported amount to 25 tons, including Hausa cake, 1s. 10d. to 1s. 9¼d.; Lahou cakes, 1s. 8½d.; Accra paste, 9d.; and Benin plantation biscuits and sheets, 2s. 9d. per lb.

The auctions on February 24th and 25th were the largest on record, and in accordance with the private market prices showed a considerable decline from those realized at the previous sale. Against 3s. 0½d. for both hard fine and soft fine, No. 1 Crêpe and smoked sheet opened with a drop of 2½d. per lb., and some of the dark and barky grades were fully 3½d. down. Scrap was in good demand, but fell about 4d. per lb. in price. Prices remained very steady throughout the sale, except for the lower grades, which had a downward tendency. Mediums were not in good demand, and very few of those on offer were sold.

After a moderate trade at easy prices since the last auctions, the large quantity of 1,340 tons was offered and sold at the public sales, March 10th and 11th, with active competition at fully the previous values on the average.

With Standard Crêpe at 2s. 4¼d., Hard Fine Pará 3s., forward 3s. 0¼d., and Soft Fine 2s. 11½d., Caucho Ball 1s. 9¾d., Plantation Malaya (1,030 tons) sold as follows: Crêpe, fair to fine pale, dull to good palish (2 lots 2s. 4¾d.), 2s. 3¾d. to 2s. 4½d.; light brown and grey, part streaky, 2s. 2¾d. to 2s. 4d.; fair to good clean brown, 2s. 1¼d. to 2s. 3½d.; dark and specky brown, 1s. 11½d. to 2s. 2d.; dark and black, part pressed, 1s. 11¼d. to 2s. 1¼d.; dark and black, inferior, 1s. 9d. to 1s. 10½d.; dark to good smoked, 2s. 1d. to 2s. 3½d.; cured by "Byrne" process, dark to good (sheet, 2s. 4¾d. to 2s. 5¼d.), 2s. 0½d. to 2s. 4d. Sheets, fair to very fine smoked (Highland, 2s. 6d. to 2s. 6¼d.), 2s. 4½d. to 2s. 5½d.; damp, mouldy and part smoked, 2s. 2¾d. to 2s. 4½d.; fair to fine unsmoked, 2s. 3½d. to 2s. 4¼d.; damp, mouldy and stuck, 2s. 2½d. to 2s. 3½d. Block, fine pale Lanadron, 2s. 4d. to 2s. 4¼d. Scrap and Virgin, fair to good, 1s. 8d. to 1s. 11¼d.; mixed and inferior, 9d. to 1s. 7½d. Rambong, Crêpe, 2s. 2d. to 2s. 3d.; scrap and block, 2s. 1d.; Ceará, sheet (Castilloa sheet, 1s. 10¼d. to 1s. 10½d.), 2s. 3¼d. Ceylon (310 tons) sold: Crêpe, thick dull to fine (very fine, 2s. 4¾d. to 2s. 5d.), 2s. 3¾d. to 2s. 4½d.; fair to fine pale, dull to good palish, 2s. 3¾d. to 2s. 4½d.; light brown and grey, part streaky, 2s. 3d. to 2s. 3¾d.; fair to good clean brown, 2s. 1½d. to 2s. 3½d.; dark and specky brown, 2s. to 2s. 2d.; dark and black, part pressed, 1s. 11½d. to 2s. 1½d.; smoked, nothing offered. Sheets, fair to good smoked, 2s. 4¾d. to 2s. 5½d.; damp, mouldy and part smoked, 2s. 3d. to 2s. 4¼d. Sheets and Biscuits, fair to good unsmoked (fine, 2s. 4¾d.), 2s. 3½d. to 2s. 4¼d.; damp, mouldy and stuck, 2s. 2½d.

to 2s. 3½d. Scrap and Cuttings, fair to fine, 1s. 9d. to 2s. 1d.; mixed and inferior, 1s. 5½d. to 1s. 7½d.

Of other kinds Manihot good Crêpe realized 1s. 9d. to 2s. 1½d.; clean pats, 1s. 8d.; sandy ditto, 1s. 4¾d.; Lewa ball, 1s. 4d.

Mozambique.—Nyasa red slab, 1s. 5½d. to 1s. 6d.

Commenting on the week's work, Messrs. Zorn and Leigh-Hunt wrote on March 11th as follows: "The fortnightly rubber auctions have achieved a fresh record as to quantity, the total amount catalogued being nearly 1,350 tons. The whole of the rubber offered is being readily taken at about 2s. 4¼d., and the share market has hardened all round upon this satisfactory evidence of a good demand for the commodity."

Pará rubber statistics for the month of February (tons):—

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará	3,230	1,370	= 4,600	agst. 4,980	4,840	5,790
Shipments to Europe	2,400	960	= 3,360	„ 2,780	2,490	2,620
„ „ America	1,300	540	= 1,840	„ 1,790	2,640	1,500

Crop statistics, June 30th, 1913, to February 28th, 1914 (eight months):—

		Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10.
Pará {	1913-14	20,770	4,740	25,510	29,170	25,710	25,700	26,970
Receipts {	1912-13	24,200	4,970					
„ Shipts.	Europe	10,710	2,890	13,600	15,430	13,320	12,680	12,190
„ „	America	9,800	1,910	11,710	14,190	13,470	9,840	14,020

Coco-nut Products, &c.

FEBRUARY closed, according to Messrs. Mordaunt Bros., with an idle market for coco-nut oil, buyers preferring to look on rather than buy. Prices, therefore, are more or less nominal at 44s. for Cochin and 41s. 3d. for Ceylon on c.i.f. terms, against 45s. and 43s. to 43s. 6d., the quotations on February 21st. This date (February 21st) also marked a drop of 7s. 6d. a ton in palm kernel oil, which then remained fairly busy and closed at 41s. 3d. to 41s. 4½d. per cwt. on February 28th, but a further drop of 12s. 6d. = 20s. in all per ton (or 1s. per cwt.), took place during the first week in March. After large sales, palm kernel oil still remains fairly active and steady in price.

Prices on March 7th were quoted as follows:—

<i>Palm oil (Liverpool):</i>	1914	1913	1912
Per cwt.			
Lagos	34s. 3d. to 34s. 6d.	32s. 3d. to 32s. 6d.	28s.
Benin	29s. 9d.	28s. 9d.	26s. 6d.
Congo	25s. 9d.	26s. 6d.	24s. 6d.
Bleached	32s. 9d. to 33s. 6d.	33s. 6d. to 34s. 6d.	31s.
Clarified	30s. to 31s.	29s. to 30s.	28s.
<i>Palm kernel oil</i>	40s. 3d. to 40s. 9d.	39s. 3d. to 39s. 6d.	34s. 6d./36s. 6d.
<i>Coco-nut oil:</i>			
Cochin	51s.	47s.	43s. to 44s.
Ceylon	45s.	44s.	41s.
English pressed	40s. 6d.	38s. 3d.	34s. 6d./36s. 6d.
<i>Copra oil:</i>			
Ceylon	None	42s. 3d. to 43s.	38s. to 39s.
Cochin	52s.	None	40s. 3d.

According to the *Public Ledger* of March 7th, prices ruled as follows (per ton):—

Soya Oil.—Oriental (in cases) afloat, £25 5s. c.i.f.; January-February, £25 7s. 6d. c.i.f.; February-March, £25 10s. c.i.f.; March-April, £25 10s. c.i.f.; April-May, £25 10s. c.i.f.; May-June, £25 15s. c.i.f. Antwerp.

Coco-nut Oil flat. Ceylon spot, £45 10s.; February-March, £41 5s. c.i.f.; March-April, £41 5s. c.i.f. Cochin spot, £52; March-April, £44 c.i.f.

China Wood Oil.—London spot, £30; February-March, £29; March-April, £29; April-May, £29 c.i.f.

Palm Oil.—Lagos on spot, £36.

Palm Kernel Oil.—March, £39 15s.; April-June, £40 f.o.b. Hamburg.

Soya Oil Beans.—Parcels spot, £8 2s. 6d., afloat, £8 5s.; February-March, £8 6s. 3d.; March-April, £8 6s. 3d. Hull.

Linseed Cakes.—London made, £7 7s. 6d. to £7 12s. 6d.

Cotton Cakes.—London made, £5 to £5 2s. 6d.

Copra quiet. Malabar, January-March, £29 10s. sellers Hamburg. Ceylon, January-February and February-March, £29 5s. sellers Hamburg. Java, January-March, £27 10s. sellers, and March-May, £27 10s. buyers Holland, Hamburg and Bremen. Macassar, January-February, £27 7s. 6d. sellers, and January-March, £27 7s. 6d. Holland, Hamburg and Bremen. Singapore, January-February, £27 12s. 6d. February-March, £27 12s. 6d., and March-May, £27 7s. 6d. Hamburg. Cebu, December-January and January-February, £27 10s. sellers Hamburg. South Sea Island, December-January and January-February, £27 10s. sellers London. F.M. Straits, January-February and February-March, £27 2s. 6d. sellers Marseilles. Manila, January-March, £26 sellers, and February-April, £26 2s. 6d. Marseilles. Mixed no Padang, January-March, £26 2s. 6d. sellers, and March-May, £26 5s. Marseilles, all c.f. and i. delivered weight.

Regarding coco-nut oil, Messrs. Goodlake and Nutter report that the market at the moment for nut oils is in a very unsettled state. There has been a fair amount of business done in Ceylon oil at about 42s. c.i.f. London, but buyers' ideas are now below this figure. America is still out of the market, and there is practically nothing doing. Cochin oil: We quote 44s. 9d. c.i.f. London. Palm kernel oil: The market has been somewhat demoralized, and there have been sellers down to 40s. f.o.b. Hamburg, but have now withdrawn, as at the lower values buyers seemed more inclined to operate, and sellers are now asking a little more money. Pressed oil: There is practically no inquiry at all, and we quote 40s. 6d. f.a.s. London in Ceylon casks. Spot prices: Ceylon, £44 to £46; Cochin, £48 to £52.

Meanwhile, whilst soap-makers and others are competing for the oil, the butter-maker promises to be a serious opponent as well. *On dit* that experiments are being carried on in London and elsewhere to perfect the processes whereby soya oil can be solidified and turned into cheese as well as butter for human consumption. This is confirmed by an article on the subject in the *London Times* (now a penny) of March 16th. The *Tropical Agriculturist* for February also calls attention to the fact that a factory for the making of synthetic milk from soya beans and other ingredients is shortly to be established in Liverpool, which will work according to Dr. Fritz Gossel's process (of Stockheim, Essen, Germany). For the production of 100 litres of milk the procedure is as follows: About 10 kilos of finely ground soya beans (or earth or pistachio nuts, or sesame or teal seeds or

mixtures of same) are mixed with about 100 litres of water and a small quantity (above 5 grm.) of phosphate of soda or potash or the like, allowed to stand about an hour, and then slowly brought to the boiling point and only just allowed to boil; the liquid is then suitably filtered and the residue pressed after it has been cooled to about 50° C. About 2.4 kilos of milk sugar or other suitable carbohydrates, about 6 grm. of sodium chloride and 60 grm. of carbonate of soda are dissolved in the liquor run off, and about 2 kilos of sesame oil or any other suitable mixture of fats or oils are mixed with the solution. The milky liquor obtained would be brought to the volume of 100 litres by the addition of pure water. The "milk" can be manufactured at a cost which will admit of its being sold to dealers at 2d. per quart.

The Ceylon exports were:—

	1913	1	1911
Coco-nut oil ...	531,480	371,676	495,466 cwt.
Copra ...	1,097,092	589,990	782,034 "
Desiccated Coco-nut ...	293,632	273,334	275,761 "
Coco-nut poonac ...	324,960	162,616	207,527 "
Total cwt.	2,247,164	1,397,616	1,760,788
„ tons	112,358	69,880	88,039
Coco-nuts (in shell)	16,469,064	15,619,801	15,269,723

The London Cocoa Market.

BY THE EDITOR.

THE first note I have jotted down for this month is to the effect that, according to the *Gordian*, the Gold Coast exported in December 11,304 tons of 1,000 kilos, and not 8,000 only, as I estimated on their figures, in the table I included in the January issue (p. 19). If our Hamburg contemporary is correct, and I have no doubt that they are, then, instead of 47,927 tons put down for 1913, the Gold Coast total was 51,729 tons, and the total for the six centres for 1913 will work out at 196,202 tons (each 1,000 kilos). Our best thanks are due to the *Gordian* for the up-to-date tables they include in their journal every other fortnight, but it does seem very bad management on the part of this country, and of London in particular (for Liverpool may have the figures but keeps them up there), that we have to go all the way to that much maligned country, called Germany, for figures respecting the output of cocoa from the largest producing centre, especially as it belongs to us. Our Hamburg friend even gives the estimated export from the Gold Coast for January-February, placing it at 15,000 tons, against 15,970 tons actual shipments last year. These figures may be exceeded, but it is something to go by, and certainly is better than the blanks we get over here. According to Messrs. C. M. and C. Woodhouse, actual shipments from the Gold Coast were 112,813,800 lb. (50,363 tons), against 86,787,595 lb. (38,744 tons) last year and 89,412,153 lb. (39,916 tons) in 1912. Speaking of the Accra market, this firm reported, on March 9th, that the demand had been slow during the past fortnight, especially for f.a.q. (fair average quality), and importers have had to give way in price to effect sales, closing values being 52s. 6d. to 53s. for f.a.q. and 55s. 6d. for fermented (against 63s. 6d. to

65s. 6d. a year ago). Up at Liverpool the last sale, of some 4,000 bags, was reported as being at 53s. to 56s. 3d., against 57s., for Victoria (Cameroons). Havre, as on p. 60, quoted Accra kinds on February 28th at 70 fcs. to 74 fcs., against 79 fcs. to 83 fcs. a year ago. This port (Havre) received 41,194 bags of Accra kinds, in January (21,887 bags) and February (19,307 bags). She ought not to run short just yet, having 64,557 bags on hand.

Crossing the Atlantic to Bahia, I have to report that a friend living at Rio, who owns the "Germania" and "Sans Souci," among other estates right up the Jequitinhonha River, writes to say that he, the same as we were then receiving in London, had had general news of "tremendous floods" having occurred throughout the cocoa districts of the State of Bahia. The Rio Pardo in particular had played havoc in Cannavieras, Ilheos, Cachoera, Saõ Felix, Taperoa, &c., showing over how extensive an area mischief had been done. All must regret the loss to the planters, and I feel sure that all the readers of TROPICAL LIFE will join me in tendering our sincere sympathy to the sufferers, especially as I understand life, as well as property, has unfortunately been lost.

At one time doubt was expressed as to what cocoa had come through. It was my opinion that the cocoa to be exported to the end of January might have been got through before trouble overtook the planters; whether this has been the case or not, Bahia certainly had a very heavy output from July-December last year, viz., 21,818 tons (Engl.), against only 15,000 in 1912, which certainly was a short year; as in 1911, the Bahia receipts were 579,250 bags, against 416,093 in 1912, and 484,182 bags last year. In January-February, again quoting the *Gordian*, 6,378 tons are estimated to have come forward, against 4,549 tons in 1913, so receipts are still going ahead.

I have been "grizzling," as one man put it, because good middling to fine red Trinidads have been selling at only 64s. to 65s., against 63s. to 65s. 6d. for good to fine Grenada marks. The Trinidad shipments certainly have been very heavy during January (44,300 bags); we are glad they were, but the prospects do not seem so "chirpy" as to warrant this growth selling so low in comparison to Grenadas. At present prices manufacturers, we should imagine, would be wise to buy freely of this growth.

Coming to consumption, I am pleased to see, for once, that the deliveries of raw cocoa in February for home consumption shows a substantial increase, nearly 1,100 tons, whilst foreign manufactured has gone back. Here are the figures:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Feb. 28th). Tons.
Jan.-Feb., 1912—	10,103	4,314	870	14,556
„ 1913—	8,229	4,978	1,427	11,217
„ 1914—	10,948	6,452	1,446	10,940
	Incr. 2,719	Incr. 1,474	Incr. 19	Decr. 277
Foreign Manufactured—	Landed.	Del'd H.C.	Landed.	Del'd H.C.
1914 ...	806	886	1,556	1,655 tons
1913 ...	962	915	1,987	1,908 „
1912 ...	1,004	1,034	1,719	1,809 „

In January deliveries for consumption amounted to 2,147 tons (Engl.), against 1,625 tons last year.

Coming now to stocks, these work out as under:—

	1914. Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
<i>Havre Stock, February 28th—</i>				
Pará ...	4,940	81 to 86	11,846	87 to 90
Bahia ...	11,636	74 „ 81	16,084	85 „ 91
Venezuela ...	38,993	76 „ 200	11,934	89 „ 200
Trinidad ...	17,690	78 „ 82	15,686	93 „ 100
Grenada and O.W.I.	2,151	72 „ 80	1,724	80 „ 92
San Thomé ...	6,689	78 „ 80	4,112	89 „ 91
San Domingo ...	1,405	72 „ 74	8,653	76 „ 81
Haiti ...	7,112	64 „ 77	7,870	70 „ 82
Accra ...	64,557	70 „ 74	56,713	79 „ 83
Guayaquil... ..	23,794	75 „ 81	21,435	86 „ 92
Others ...	11,317	—	7,027	—

Totals ... 190,284 bags 163,084 bags

	1914. Bags.	1913. Bags.	1912. Bags.
<i>London Stock, March 14th—</i>			
Trinidads ...	6,269	3,561	5,657
Grenadas ...	8,701	6,526	10,985
Other W.I. ...	3,705	3,824	7,553
British Africa ...	13,691	9,576	14,379
Portuguese Africa	5,130	7,556	6,825
German Africa ...	2,390	7,769	5,391
Ceylon and Java ...	11,252	16,855	11,127
Guayaquil ...	25,527	10,730	42,903
Brazil and Bahia	506	3,452	398
Other Foreign ...	9,803	8,223	7,379
Totals ...	86,974	78,072	112,597

Coming to the matter of prices, they ruled higher at and around the auctions of March 3rd than is the case with the rates below, which include the auctions of March 17th, and business done up to then:—

Trinidads.—Superior, 67s. to 71s. 6d.; good mid. red to fine good red marks 64s. to 65s.

Grenadas.—Good to fine marks, 62s. 6d. to 63s. 6d.; good fair to good reddish, 61s. to 62s.; ordinary unfermented to good fair fermented, 56s. to 60s.

Dominicas.—Good red marks have been selling up to 63s. 6d., and ordinary unfermented down to 57s.

St. Lucias included some nice lots, which recently sold up to 66s. 6d. for fine, and 62s. to 64s. for good reddish to good red, but prices are now lower.

Jamaicas.—Good red sold at 62s., and fine up to 64s. and 64s. 6d.

St. Vincent.—Fiery red has been selling up to 64s. 6d. to 69s., and 62s. for reddish.

British African.—Last sales from Liverpool included 4,000 bags, at 52s. 6d. to 55s. 9d., according to quality, against 62s. to 63s. nominal value of San Thomé, and 61s. 6d. to 63s. for German Cameroons. Buyers maintain, however, that lower prices must be accepted before further business can be done.

Costa Rica.—Good to fine red marks sold at 63s. 6d. to 65s. 6d., extra bold 78s.

Panama.—Ordinary kinds realized 55s. to 57s., extra bold 82s.

Samana.—Fair reddish went at 57s

Java.—Bold sold up to 80s., medium down to 72s.

Samoa.—Bold sold up to 80s. 6d., medium down to 70s. Later good to fine realized 67s. to 74s. 6d.

Guayaquils continue to drag, although privately, I understand, a fair business has been done. Sales published include Tumaco at 58s, and Caraquez at 60s. to 63s.; whilst the nominal value of Arriba runs around 62s. to 68s.

Ceylons have been selling well, including fair to good medium and bold, 77s. 6d. to 83s.; ordinary to fair medium, 68s. 6d. to 75s. Common native has been realizing 50s. to 54s.

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Our Books.

PRESSURE of space has prevented us from inserting in these columns, as we intended, the latest press notices on our last two books, viz., "The Fermentation of Cacao," and the second edition of "Coco-nuts—the Consols of the East." We again, however, include some of them in our advertisement pages, xxviii and xxxiii, to which we must refer our readers.

From "Our Readers."

IN NORTH CANADA "TROPICAL LIFE" CIRCULATES
WHILST THERMOMETER IS 54° BELOW ZERO.

THE following trio of letters show how we get about, and what our readers think of us:—

A Bluefields (Nicaragua) writer, under date February 27th, says: "I have just received the January number of TROPICAL LIFE, and, as usual, find it most interesting. Your review of Mr. Fawcett's new work on banana culture has caused me to eagerly await the copy of the book I ordered in September last. . . . Although engaged in the banana business, I take a lively interest in all tropical industries and cannot close without telling you how I appreciate your paper and look forward to its coming every month."

Leaving this flourishing tropical centre we go north to, *pro tem.*, bleak and sunless Edenbridge in North Canada, whence comes a letter saying: "I am feeling extra ashamed of myself for not writing you before. Since Christmas it has been intensely cold, ranging from 20° to 54° below zero. I much appreciate TROPICAL LIFE, which arrives regularly; there is something comforting about the very name when you are obliged to wear four pairs of the thickest woollen socks inside boots lined with felt nearly $\frac{1}{2}$ in. thick. I sometimes wish that the Journal had come my way when I was young, so that I could have possibly now been basking in some coral isle beneath the shade of palm trees, reaping a handsome income from the coco-nuts."

Mr. Rudolph Anstead, of the Scientific Département, Southern India, writes: "TROPICAL LIFE grows more interesting and I always look forward to receiving it. I am just leaving for England, after an absence of five years, and have been appointed official delegate to the Rubber Exhibition and the Congress of Tropical Agriculture."

Coming to London, our friends, the Nitrogen Fertilizers, Ltd., when increasing their advertising space by taking the half-page at the conclusion of the cocoa-market report, wrote: "Your journal is of the utmost service, not only to the public, for whom it is primarily intended, but to people like ourselves who want to keep in touch with agricultural progress in the Tropics."

The Practice of Cacao Fermentation.

By ARTHUR W. KNAPP, B.Sc.Lond., F.I.C.,
B.Sc.Birm.

(Continued from p. 43.)

PART II.

The Beans.—When the beans are scooped out of the pod, those from diseased pods should be put on one side. These must be treated separately. The rest should be freed from the placenta, "guts," or "heart." The "guts" should now be mixed with the beans (see Appendix E), and the whole transferred immediately to the boxes.

Depth.—The beans should be put in the boxes to a depth of from 2½ ft. to 3 ft.

Covering.—They should then be levelled down, and covered with several layers of fresh-cut banana or balissier leaves. These may be pressed close to the beans by a few boards.

Turning.—Every day they are shovelled into an empty box. It should be remembered that the principal object of this turning is to *mix*, and the beans on the outside of the box should be transferred to the centre of the empty box. Wooden shovels should be used to prevent damage to the beans.

(For loss of heat on turning, and labour-saving devices, see Appendix F.)

Sweatings.—(For quantity and composition, see Appendix G.)

Duration of Fermentation.—The time necessary to obtain a good fermentation varies with the kind of bean and the season of the year. With Trinidad beans, in which Forastero predominate, the shortest period is five days and the longest nine. If fermentation proceeds correctly, after three to four days the internal changes which give to cocoa its characteristic rich colour, and fine aroma and taste, are produced; but the bean is still flat, and to produce a plump bean we must continue the fermentation for another two to three days.

(For new method of increasing the speed of fermentation, see Appendix H.)

Rise of Temperature.—If fermentation proceeds properly, then in Trinidad the temperature of the mass will be as follows:—

	Degrees Cent.		Degrees Fahr.
After 1 day ...	30	or	86
" 2 days ..	37	"	98
" 3 " ...	47	"	117
" 4 " ...	48	"	118
" 5 " ...	49	"	120
" 6 " ...	49	"	120

(For notes on taking temperature, see Appendix J.)

How to know when to Remove from Sweat-box.—If I were asked to give a rule, I should say: Do not remove from the box before the beans are plump, brown without, and juicy within. The following observations on this should prove useful:—

The external appearance of the bean gradually changes from almost white to a rich brown. It should be a deep brown before removal from the box. By that time the beans will have become plump and round, and the external pulp, now of the consistence of thick paste, easy to remove.

The internal appearance of the bean alters also. If the beans are fermenting properly a notable change is observed after sixty-four hours, or, roughly, after three days. From being mottled and heliotrope, the interior has become more red, and the colour is smooth and even. From being dry inside the bean has become wet. When a bean has been juicy for two or three days, and becomes wetter inside than out, and so full of juice that it spurts out

when cut, then it is well fermented. It will be noticed then that there are spaces (between the two cotyledons forming the bean) filled with a purple or brown sticky liquid.

The odour of the mass during fermentation changes from a delicate, melon-like odour to a heavy, sharp, fragrant acid odour (apparently ethyl and amyl esters with a little acetic acid). At the end the odour

develops also a suggestion of sour barm.

Removal from the Box.—The beans should now be removed at once from the box to the drying houses and spread in a thin layer in the sun. The first two nights they should be made into small heaps, and covered with clean banana leaves to allow fermentation to continue. That fermentation (mainly oxidation) occurs is shown by the rise in temperature. (Thus some beans, after seven days' sweating in box and one day's sun-drying on floor, were heaped 18 in. high and covered with plantain leaves. The following morning their temperature was 42° C., or 108° F.)

Of the art of drying I do not know sufficient to speak. The science of drying is to expose the beans for a long time to warm air. It is to be regretted that the temperature of the beans is permitted to fall at sundown, as the night periods are thus practically wasted from the point of view of colour change in the interior. Where artificial heat cannot be applied, an attempt might be made to retain this heat both by covering the beans with leaves, and by having the underside of the platform protected from the cool air by being double, with an air space of 6 in.

(To be continued.)



S = Sweating-boxes. In wet weather, note the ingenious use of ↑ trap through which beans are raised on to drying platform, and ↓ trap through which beans are lowered into bags and weighed.

At Present Prices, is the Position of Copra Critical?

SEVERAL of our contemporaries seem very much concerned over the present price of copra compared to what it was six months ago. From the tone in which some of them discuss the situation one would imagine the copra-producing world to be in as dire straits as are the rubber-producing centres along the Amazon, and through them Brazil, as a whole, is said to be. Here is quite a moderately worded review of the situation from the Ceylon press, entitled, "A Copra Crisis, the Market Sinking: Reported Failure of German Firms." "The coco-nut industry of the island is to-day passing through a crisis owing, it is alleged, to the failure of two or three large German firms, the indirect result of which has been to glut the markets of London and Hamburg with copra. Yesterday the top price fetched for the article was Rs. 83.25 per candy,* and to-day (March 26th) a representative of this journal was informed that the market was sinking. Coco-nuts, which a fortnight ago were offered for Rs. 73 per thousand, and which had previously fetched Rs. 80, are now being offered only at Rs. 65, with the probability of a further drop within the next few days. Those who are being hit the hardest are dealers who have entered into contracts for copra at about the figure which ruled some weeks ago. Planters, although losing the difference in price, will by no means be losing on production, the margin of profit on existing and even lower prices being quite sufficient."

We are not copra-market experts in the full sense of the word, but when we look back at the prices quoted in TROPICAL LIFE during the past two years we fail to see any cause for alarm, any more so than we do because fine Grenada cacao sells at 58s. to 60s. to-day, against 66s. last September. Let us glance at a rough table of copra prices during the last two years, and then see whether or not there is really any cause for alarm. Most emphatically we say there is not.

1912.		PRICE PER TON.										
		Malabar.			Ceylon.			F.M.S.*				
		£	s.	d.	£	s.	d.	£	s.	d.		
May	...	28	2	6	...	27	12	6	...	26	5	0
June	...	27	5	0	...	26	15	0	...	28	0	0
July	...	27	12	6	...	26	15	0	...	24	17	6
August	...	27	17	6	...	26	15	0	...	25	0	0
September	...	28	10	0	...	27	10	0	...	26	5	0
October	...	29	0	0	...	28	0	0	...	26	12	6
November	...	28	10	0	...	27	15	0	...	26	7	6
December	...	28	7	6	...	27	15	0	...	26	15	0
1913.												
January	...	29	0	0	...	28	10	0	...	27	18	9
February	...	29	17	6	...	29	10	0	...	28	17	6
March	...	30	5	0	...	29	15	0	...	29	0	0
April	...	31	7	6	...	30	12	6	...	29	12	6
May	...	30	0	0	...	29	12	6	...	28	0	0
June	...	31	7	6	...	30	5	0	...	29	0	0
July	...	31	17	6	...	31	10	0	...	29	5	0
August	...	33	0	0	...	33	0	0	...	31	0	0
September	...	32	7	6	...	33	12	6	...	31	12	6
October	...	32	10	0	...	32	10	0	...	31	5	0
November	...	32	5	0	...	32	2	6	...	30	12	6
December	...	32	15	0	...	32	0	0	...	31	12	6
1914												
January	...	31	15	0	...	31	5	0	...	30	0	0
February	...	30	12	6	...	29	17	6	...	29	2	6
March	...	29	10	0	...	29	5	0	...	27	12	6
April	...	28	0	0	...	27	12	6	...	26	0	0

* F.M.S.—Fair merchantable sun-dried.

* Against Rs. 104.75 per candy (560 lb.) in September last, and, we believe, Rs. 106, the top price actually touched last year.

Prices to-day, therefore, are much on a parity with those ruling when we published the first edition of our book on coco-nuts, and "the world went very well then" as regards prices, and so, we believe, it does now. Perhaps it is the very high cost per acre that we are told must be incurred when laying out a company-owned estate that is upsetting copra sellers; but to this we would answer, "If you have been calculating on running your estate on a basis of £30 to £33 a ton for copra, your estimate is much too high; far better float your company on a basis of £25 a ton, and if you cannot turn out the copra to pay a fair profit at that price, turn your attention to some other industry and leave copra production alone."

THOSE of our readers who are interested in the cultivation of limes (*C. medica*, var. *acida*) will find the brochure recently issued by the Imperial Department of Agriculture at Barbados, on "Lime Cultivation in the West Indies," of great value. Pamphlet No. 53, entitled "The A.B.C. of Lime Cultivation," issued in 1908, being out of print, the opportunity was taken, the preface tells us, in preparing the handbook under notice, to revise and bring the information available up to date. In the 136 pages of the book, which costs ninepence, this has certainly been done, and those wishing for further knowledge will find throughout the book, and especially in the lengthy list at the end, a considerable number of articles, pamphlets, &c., giving exhaustive information on the subject, that can be studied.

Dominica is now the premier producing centre. In 1848 she exported £280 worth of limes, which fell to only £12 in 1857, which thirty years later had grown to £8,561. The value of lime products exported during 1911 from the several West Indian islands is given as follows:—

Dominica	...	...	...	£73,882
Montserrat	...	...	...	9,127
Trinidad	...	...	...	1,628
Antigua	...	...	...	1,636
St. Lucia	...	...	...	290
				£86,563

As the exports from Dominica alone in 1912 were £96,673, the above figures must be much larger by now. Montserrat suffered from the hurricane that swept over the island in 1899, from which the plantations have never entirely recovered.

LATEST reports from North Queensland show that the cultivation of coco-nuts is increasing fast, especially in the vicinity of Cape York, Mossman, and between Mourilyan and Cardwell. Good markets for the whole husked nuts are being obtained at present, but even if made into copra, the present prices would make this a remunerative industry. In London the latest quotations show a value of over £31 per ton as having been touched, and it is understood that £26 per ton is being offered in the Commonwealth, though few if any sales of Queensland-grown copra have as yet been made. Meanwhile, as can be seen in the preceding column, prices now are at £28 or lower.

Tobacco Planting.

PART V.

GOING back to the varieties of tobacco, about which we started discussing in our December issue, the first thing the would-be planter has to decide is the variety that will suit his soil and climatic conditions best, or if he has the choice of several varieties as he will probably have, which variety will pay him best according to the market or markets he is hoping to supply. Sumatra and Florida Cuban are "wrapper" tobaccos and frequently produce as much as 80 per cent. of wrapper, the rest being used for binders or fillers, says Mr. W. B. Wilson in the *South African Agricultural Journal*, after reminding us that there are three kinds of cigar tobacco, viz., filler, binder and wrapper. The chief value of Sumatra tobacco, he goes on to say, lies in its thin but tough elastic leaf, the absence of any strongly marked taste or aroma, and the fine finished appearance it gives a cigar, whilst Florida Cuban leaf produces a very valuable wrapper usually a little thicker and more aromatic than the Sumatra leaf.

Binder and filler kinds are supplied, we are then told, by Connecticut broadleaf, Havana seed, and Zimmer Spanish kinds, the first named occasionally supplying a few fine wrappers. We notice that the *Ceylon Agriculturist* reproduced this article of Mr. W. B. Wilson in its issue for January last, and we would recommend our readers to either study this reproduction or the original article in our South African contemporary, for it gives many details of the utmost importance *re* tobacco characteristics, shade-grown tobacco, and curing. In conclusion, runs the article, cigar wrapper tobacco can be grown in the Barberton district, South Africa; and Sumatra is the most suitable variety so far tried. The notes wind up by warning us as follows: Seed-beds must be burned to secure the seedlings being free from root-gall-worm; that the tobacco must not be planted in sour land, new land, nor in land badly infested with the worm; that the soil must be sweet, fertile, and well prepared; that cultivation should be thorough and often; that insects eating the leaves must be kept in check; and the leaves must be picked in the early stages of ripeness and cured slowly but regularly and not allowed to "sponge" or "pole sweat." Much work is needed to determine such points as the relative values of shade-grown and sun-grown tobacco; the kind of fertilizers to apply to get the best results; experiments to test untried cigar wrapper varieties; to try and produce a good filler on some untried soil or with some new variety; and to discover the best way to control certain insect pests.

The usual care has to be exercised in the selection of soil, and in transplanting and cultivation, writes the *Barbados Agricultural News*, in calling attention to the same article. As regards topping and suckering, it is stated that if Sumatra tobacco is topped at all, it should be done just as the bud of the flower shows; then twenty to twenty-eight leaves should be left on each plant. About two weeks after this the suckers will have to be removed from the axle of the leaf. The latest approved method of producing fine wrapper tobacco, however, is to leave the tops on the plants. Harvesting is done by pruning, *i.e.*, picking off the

leaves as they ripen from the bottom of the stock upwards. Picking should usually begin just after the plants come into flower. The proper condition in which to pick the leaves is told by the feeling and appearance of them. Exactness in determining the correct stage of ripeness is best acquired by experience, as all plants that are ready to harvest do not look alike; but, in general, the leaf will have a dull appearance and feel thick and leathery, sometimes showing faint yellowish flakes. These flakes are very characteristic on the top leaves, but are often indistinct on the lower ones, so that if we wait for them to become distinct before picking begins, the bottom and middle leaves will be over-ripe. The middle leaves of the plant are not thoroughly ripe until these flakes are developed, but the best wrappers are obtained by picking them a little under-ripe. The top leaves being small, are used for filler instead of wrapper, and should be allowed to get thoroughly ripe.

In curing leaf tobacco no exact rule can be laid down. The curing shed must have thorough ventilation and should not allow of too high a temperature inside. When green tobacco is first hung in the shade, the doors should be closed tight for three or four days until the leaves have yellowed. When this has happened the ventilators must be opened in order to permit the driving off of all surplus moisture. Sometimes it is necessary to increase the moisture in the shade by hanging up wet sacks. When all of the leaf except the midrib is cured, the shed may be opened during the day and closed at night. When the tobacco is fully cured it should be kept thoroughly dry and the shed kept tightly closed.

The same paper (*Agricultural News*) also gives us the following details translated from a report issued by the Deli Experimental Station, Sumatra: "Recently efforts to get a quicker germination of the seed of beet-roots and a stronger growth of the young shoots have been made with some success. The method adopted is to dry the young seed during twenty-four hours and at a temperature of 55° Celsius. The seeds do not suffer from root blight, whereas those that have been untreated are generally destroyed.

Similar experiments have lately been carried out with seed of Sumatra tobacco. Small quantities were dried during twenty-four hours at 50° Celsius in a dry air tube above unslaked lime, above calcium chloride, and lastly also above strong sulphuric acid. Equal quantities of the original samples were sown as controls. No quicker germination of the dried seeds could be noticed. The plots did not show any difference compared with the controls after seven, ten, fourteen and twenty days. Neither was it proved that the treated seeds can resist diseases, as part of the shoots grown from the treated seed was badly attacked by phytophthora. It is believed that the beneficial effect of heating on the seed of beet-root is due largely to its peculiar construction, which causes it to profit more by being well dried than tobacco can."

Cuban tobacco exports from Havana during 1912 and 1913, as compiled by *El Tobacco* of Havana, were:—

Jan.—Dec.	1912.	1913.
Leaf tobacco (bales) ...	401,019	322,121
Cigars ...	178,981,472	183,234,330
Cigarettes (packs) ...	16,392,477	18,720,975
Cut tobacco (kilos) ...	353,921	285,676

(To be continued.)

The Cultivation of Cacao. No. XXXI.

THE TREATMENT OF CLAY SOILS IN JAMAICA.

As we believe that many of our cacao-planting readers may be interested in the following correspondence between ourselves and a leading planter in Jamaica, we have much pleasure in publishing it. Our Jamaica friend wrote the following paragraph in a letter dated February 27th: "I need something for my clay lands under cacao: could you advise me as to the best means of bringing such lands to a satisfactory condition for the cultivation of cacao?" To this we replied: "We understand from the information we have received from time to time of your estate that the soil in places is a strong clay and subject to floods. Clay soils are, as a rule, deficient in phosphates and lime, but well provided with potash, so that the manuring of crops grown on such soils should chiefly consist of a phosphatic fertilizer, whereas potash manures are only needed in small quantities. On account of the deficiency of lime in clay soils, phosphatic fertilizers, which, like basic slag, apply, at the same time, lime in an available form, are much more suitable than phosphatic fertilizers which supply water-soluble phosphates. A great portion of these (water-soluble) phosphates not only become less available in clay soils owing to their conversion into phosphates of iron and alumina, but also an application of water-soluble phosphates impoverishes the soil in carbonate of lime, which ought to be prevented, at all events on clay soils.

"The manuring must also include a nitrogenous manure, and considering that clay soils are, as a rule, in great need of improvement in their texture, we regard either the application of farmyard manure or the growing and turning under of a green (leguminous) crop the best means of supplying cacao trees on clay soils with the necessary nitrogenous plant food. Where farmyard manure is not available in sufficient quantities, or green manuring cannot be resorted to, either nitrate of soda or calcium cyanamid (nitrolim) may be used. On account of the deficiency of the soil in lime, we would suggest the latter. If farmyard manure can be applied in fair quantity, or if a leguminous crop can be successfully grown, as a green manure, we consider that a further application of 3 cwt. basic slag per acre is all that is wanted to supply the trees with a well-balanced food. In some cases as much as 5 cwt. basic slag per acre could be applied with advantage, and later on a dressing of a complete manure turned in.* If, however, farmyard manure or green manuring cannot be given, then a complete manuring consisting of about 5 cwt. basic slag, $\frac{1}{2}$ to $\frac{3}{4}$ cwt. sulphate of potash, and $1\frac{1}{4}$ cwt. nitrate of soda or nitrolim per acre may be used. As regards time of application, the farmyard manure, basic slag and potash should be applied by being forked into the ground before the heavy rains set in, whilst the nitrate of soda and nitrolim are best applied at the end of the rainy season."

In our December issue we discussed Mr. Malins-Smith's articles on Cacao Planting, more especially

in Grenada, in the *West India Committee Circulars*, and called attention to those numbered 390, 391 and 392 as dealing with the question of manuring. Since then we had the pleasure of receiving a letter from Mr. Malins-Smith, in which he tells us that he was revising these articles and bringing them up to date with a view of publishing them in book form. We hope he will do so, for in him we have a man of considerable practical experience, who not only believes that cacao, like other estates, should use machinery as much as possible, but has designed and patented machines to ensure the preparation of the beans for market being evenly and properly done, and at the same time, in these days of high wages, to save the labour in the factory that is so badly needed in the field. We believe this authority reckons that his polishing machine prepares his cacao at the cost of 1s. 2d. per bag of 200 lb. or rather under, and, with improvements in the machines, as well as by rearranging the buildings to facilitate and expedite the work, that this cost will be reduced to 9d. He is a believer in drying on trays, and expressed his satisfaction at what we say in our book on "The Fermentation of Cacao," which, he adds, confirms his opinions, based, be it remembered, purely on practical experience. With the advantages that machine-polishers offer to the cacao planter—either Malins-Smith's, of Grenada, or Barnard's, of St. Lucia—we are surprised that more are not in use among planters throughout Trinidad, Bahia, &c., and especially at a centre like San Thomé, where we hear so much about labour troubles. Those, however, who have tried to persuade estate owners to adopt cacao dryers which are, we should have imagined, an absolute necessity on any well-managed estate, in order to render the proprietor or manager independent of the weather, will perhaps best realize that the time has yet to come, although close at hand, when cacao, like rubber estates, will not think of starting operations without erecting a properly equipped factory in which the mechanical dryers and cacao polishers will take the place of the washing, coagulating and washing apparatus and smoke-house of the rubber plantation.

(To be continued.)

THANKS to a grant from the Board of Education and the assistance rendered by Mr. Austen Chamberlain's fund for the London School of Tropical Medicine, arrangements are now complete for the new course in Tropical Sanitation and Hygiene which will be held twice annually in the School. The first session will open on May 1st, when the course will include medical entomology, hygiene, bacteriology, public health, elementary surveying and sanitation, helminthology, protozoology, &c.

ACCORDING to the Ceylon press, a fifth mill to manufacture sugar is to be established in that island, the cost of the factory being put at £20,000. "As at present there are only four mills at work in the island," says the *Ceylon Observer*, "and these in the Southern Province, it cannot be alleged that the field in regard to the sugar industry is overcrowded. That it would pay a sound, financially well-backed company to deal in the product in Ceylon can scarcely be doubted."

* As Ohlendorff's—the mention of whose name in our December issue caused our correspondent to send the inquiry (see p. 227 in that issue, *re* manuring in Grenada).

Tea Notes.

ACCORDING to the *Tea and Coffee Trade Journal*, Texas is to go in for tea planting, and 600 acres are to be planted at or near Mercedes in that State. The same journal discusses the amalgamation as from January 1st (1914) of the tea business of our old friends, Messrs. Harrison and Crosfield, Ltd., well known in tea and rubber circles on this side, with Messrs. A. P. Irwin and Co., of Philadelphia. The Company can now boast of having pushing branches or trading centres not only in London and New York, but also in Philadelphia, Boston, Chicago, San Francisco, Colombo, Calcutta and elsewhere in India, Batavia, Shanghai, Hankow, Foochow, Shidznoka, Daitotei, &c.

Regarding actual costs of tea and rubber in Ceylon, the directors of the Baddegama Estate Co., Ceylon, in declaring $12\frac{1}{2}$ per cent. dividend for the year, report that the crops amounted to 206,972 lb. tea, costing 22.35 cents per lb. to produce, and selling at 46.71 cents, and 21,633 lb. rubber, costing $93\frac{1}{2}$ cents per lb., which realized an average price of Rs. 1.61 per lb. (1 R. = 100 cents = 1s. 4d.). The Walagama Rubber Estate declared 5 per cent. dividend and produced 19,213 lb. rubber, costing 74 cents, and selling, on an average, at Rs. 1.55 per lb. The Udabage Tea and Rubber Estate, with a dividend of 20 per cent., turned out its rubber costing 91.79 cents, including 19.79 cents for manure, whilst the tea cost 34.20 cents per lb., inclusive of 2.22 cents for manure and 8.64 cents for weeding. The current crop of tea is estimated to cost 6.30 cents per lb. for manure and 6.96 cents per lb. for weeding, whilst the upkeep of 202 acres of immature rubber is to cost Rs. 108.70 per acre, inclusive of Rs. 65 per acre for manure. Again, the Hunuwella Rubber Estate paid 9 per cent. and produced 110,729 lb. rubber, costing 78.43 cents per lb. to produce, and selling at Rs. 1.74 per lb. The Kelani Tea Garden turned out 270,929 lb. tea, at 642 lb. per acre, costing 29.50 and selling at 39.97 cents per lb., and gave 25 per cent. dividend.

Writing on April 2nd, Messrs. W. J. and Hy. Thompson reported that the market had again assumed a strong and animated tone, good deliveries and the approaching closing up of the Indian crop having apparently stimulated demand for these growths, resulting in brisk bidding and frequent advances on tea up to 9d. per lb., while very firm rates ruled

for all other kinds. The Ceylon Sales passed with an equally eager tone, particular attention being again given to the highest grades, which have recorded a further marked advance. Following this, the market closed for the Easter vacation (April 9th) with a very firm and active tone, prices in most cases showing an upward tendency, the keenest demand having again been centred on Indians in the region of 9d. per lb. and on good to fine Ceylons, which have sometimes quotably advanced. The average for the whole sale of Indian teas on Garden Account being $9\frac{1}{2}$ d. per lb. compared with $8\frac{3}{4}$ d. per lb. a year ago. Against this Ceylons realized $9\frac{3}{4}$ d. per lb. against 9d. per lb. a year ago. An interesting item in the sales during the week ending April 4th was the appearance of the first shipment of tea from Sumatra, consisting of 147 packages from the Naga Hoeta Estate. The teas were nicely

made and suitably assorted, and the liquor was clear and of useful colour. They were well secured by the trade, and realized the satisfactory average of 9d. per lb.

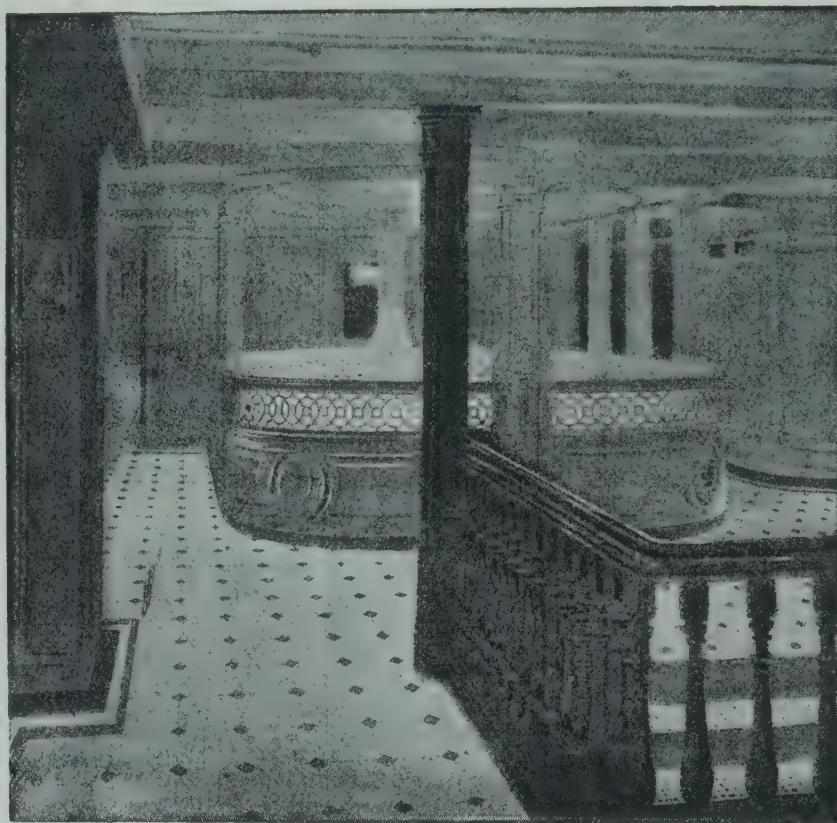
ACCORDING to the *Straits Times*, Mr. T. C. Nock may go to British North Borneo as Inspector of Coco-nuts.

REFERRING to our review of Professor Thurston Cook's useful work on "The Diseases of Tropical Plants" (Macmillan and Co., Ltd.), the author has been kind enough to point out he has mentioned Mr. Johnston's book on "The History and Cause of Coco-nut Bud-rot," viz., as a footnote on p. 201, he was unable to do more as his MS. was ready for press when the book came into his hands. Judging from

our opinion of his own work, Professor Cook will soon have to be thinking of a second edition we should imagine.

ACCORDING to the *Journal of the Board of Agriculture* (London), figures obtained from experiments carried out at Wye Agricultural College to test the digestibility of various foodstuffs for live stock go to prove that seed-cake from Pará rubber seeds is one of the most digestible concentrated foods available, due, without doubt, it is stated, to the small amount of crude fibre present, viz., 3.15 per cent. Readers of TROPICAL LIFE, therefore, who have, as suggested by us at various times, started to make arrangements to utilize their surplus rubber seeds, can, by expressing the oil on the spot, save the greater part of the freight home if the oil is exported, and at the same time have a valuable cattle food for local consumption.

Where Rubber is Used.



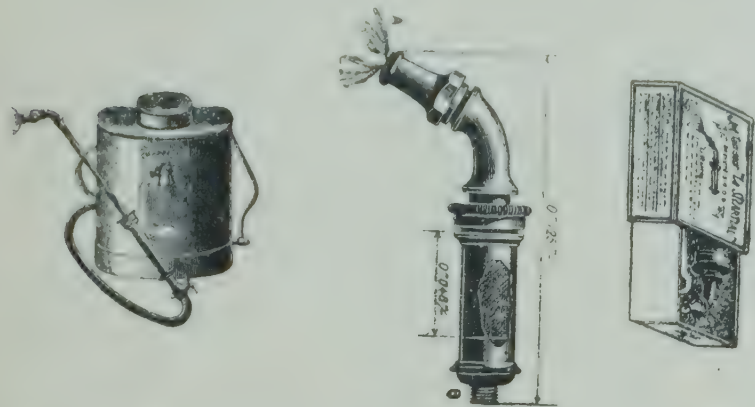
No. 1.—On Board Ship. One of the lower decks of the S.S. *Maunganui* laid with rubber tiling from the North British Rubber Co., Ltd., Edinburgh.

[Month by month we propose to include a photograph similar to the above illustrative of the more modern uses of rubber, especially on a large scale.]

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART V.

The Catalane and Chantecler Sprayers of the Société Industrielle Française (Martial Vidal).



"Chantecler" sprayer.

Nozzle.

LEAVING coco-nuts, rubber, cacao, &c., to themselves for once, we wish this month to discuss the potato and the trials and troubles it encounters whilst striving to grow vigorously and of a good size, as a well-conducted and healthy potato should do. This useful vegetable is now cultivated so extensively in the sub-Tropics and, at a higher elevation, even within the tropical zone itself, that consideration is certainly due to its preservation from pests.

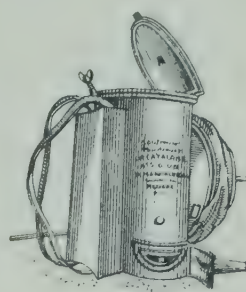
We are reminded of this owing to some notes on "Insect Pests of the Potato," that Mr. C. French, jun., Entomologist to the Victoria (Australia) Government, contributed to the December issue of the *Journal of Agriculture* of that State, and what Mr. French says of the potato can often be applied to other crops as well, tropical or otherwise. "Many insects," he tells us, "whose natural food is being destroyed as new land is brought under cultivation are turning their attention to the potato and other crops, so growers should always be on the alert." This is what planters in the Federated Malay States and elsewhere found with root diseases, white ants, &c. "With modern outfits, however," Mr. French goes on to say, "the spraying of crops is now an easy matter." Many of the insects described are known outside the potato field, which is fortunate, for we can only give the name and the remedy suggested of two or three. Those requiring fuller details must write to the Director of Agriculture, Melbourne, Victoria, Australia, for the December issue of the Department's journal, and send five pence or its equivalent for cost and postage.*

The potato thrip (*Thrips tabaci*, Lund), as one soon discovers, is a serious pest and requires united action. All debris must be collected and burnt, as doing so destroys the eggs. Tobacco water, carefully strained so as not to choke the nozzle, was used with good results, whilst benzole emulsion has proved very effective, so did a weak kerosene emulsion; again, in America, tobacco-leaf extract with oil seemed to penetrate the oily covering of the insects with considerable success.

For such work the well-known "Chantecler"

sprayer of the Société Industrielle Française would be found extremely useful, especially when fitted with "Le Martial" nozzle, which gives that fine, penetrating class of spray that is so necessary with thrips, whilst the machine itself is forceful but lasting, simple in structure, but carefully constructed of materials which, in the interior, resist the effect of acids.

Cut worms, the larvæ of various moths as the Silvery Moth (*Plusia argentifera*), Bugong Moth (*Agrotis spina*), Looper Moth (*P. verticillata*), &c., are the cause of much destruction at times on many crops. Clean weeding and burning of rubbish helps to reduce the trouble, but with growing crops, plants poisoned by being steeped in Paris Green attract the cut worms, who eat them and, being poisoned, die. The same can be done against the silvery moth by means of a poisoned bran mash. "I see no special difficulty," writes Mr. French, "in applying the following remedy on a large scale to lands planted with tobacco, maize, and other crops: Arsenate of soda, 1 lb.; molasses, treacle, or brown sugar, 8 lb.; water, 10 gals. Dissolve the arsenate of soda and the treacle in water. Cut up some green fodder into small bits, moisten it with the poisoned sweet, and then spread out after the ground has been ploughed. In this way one application will probably be sufficient, but if not it must be repeated after the young crop has appeared." For the Potato Moth (*Lita solanella*) trapping by means of lamps is of use in destroying the moths which fly at night; but when the moths first commence to make their appearance it is advisable to spray the crop with some arsenical spray, such as arsenate of lead, applied by means of the "Chantecler" sprayer before described.



When sulphur and other powdery substances have to be "dusted" over a crop, especially cotton, vines, coffee, the "Catalane" powder spreader of La Société Industrielle will be found extremely efficacious, as it is fitted with a patent powder spreader, specially arranged to throw finely distributed clouds of powder evenly over the crops or area to be treated. The machine works "true," being most carefully constructed, and is able to do its work thoroughly and at a minimum cost to the planter. No insect or other pest can withstand such treatment, so that by its use the makers claim that the trees, plants or vines are kept free from pests. Easily dismantled or put together, the container holds 8 kilos or 16 lb. of sulphur, a quantity that covers a considerable area, thanks to the nozzle through which the powder is ejected.

THE Port of London Authority have appointed Mr. Cumberland Lowndes to the position of manager to the Authority.

* It is well worth the money on account of the other articles on "Citrus Fruit Culture," "Fruit Prospects," "The Victorian Fruit Trade," &c.

Reviews.

PLANTERS, shippers, buyers, sellers, shareholders, and manufacturers of rubber (and we doubt if many people exist who do not come under one of these headings) will be glad to secure a seven and sixpenny copy (postage 4d. extra) of "Who's Who in the Rubber World," which has just been edited and published by Mr. Staines Manders from the Rubber Exhibition Offices, 75, Chancery Lane, London, W.C., to which address please apply for your copies, not forgetting to send the cost with order. In it you will find everything required *re* everyone having to do with rubber, each under their own flag, association, agricultural society, or trade name. Its 186 pages are full of minute details of one and all. Here is a specimen:—

"Smith, Harold Hamel.—Visited the Tropics in 1890-91, and again in 1895-98. Has contributed regularly ever since, mostly on tropical commerce and agriculture, in which his family has been actively interested since before 1797. Specializes in cacao and coco-nuts. Holds gold medal awarded to his father in 1876 for coco-nut fibre, and a bronze one for coco-nut products. Was awarded the bronze and silver Banksian medals by the Royal Horticultural Society (England) for his collection of cacao beans. Invented a brush for cleaning cacao and other trees, and a dryer for desiccating tropical produce. Suggested (1907) to Mr. Staines Manders the advisability of holding International Rubber Exhibitions, having previously advocated same in TROPICAL LIFE. Author of 'Notes on Cacao Planting in the West Indies' (1902), 'The Future of Cacao Planting' (1908), 'Soil and Plant Sanitation on Cacao and Rubber Estates' (1911), and, with F. A. G. Pape, 'Coco-nuts: their Cultivation and Preparation' (1912). Founded in 1905 TROPICAL LIFE, which he still edits. Is a member of, or connected with, many institutions, committees, &c., interested in the Tropics. Address: 112, Fenchurch Street, E.C."

This is but one of several thousands, only the others are more important; if therefore you want to learn all about "Who's Who in the Rubber World," send 7s. 10d. to the Rubber Exhibition Offices, 75, Chancery Lane, W.C., London, and you will have a copy of the above.

As regards Egyptian cotton, prices during the year have followed those of American cotton more than they have moved in sympathy therewith hitherto. At the end of September the prices for fully good fair brown was about the same as at the beginning of the year, 10.45d., and the year closed at 9.90d. These prices were advantageous, but the results of the season now closing are not so favourable. In 1912 the crop amounted to 7,532,920 cantars, or one million bales, about equivalent to those of 1910 and 1911, half of which is dealt with in England for the finer cotton fabrics. The estimate for 1913 season is over 7½ million cantars. The stock carried over in Alexandria at the end of the 1912 season was very heavy, amounting to 488,425 cantars, and owing to the early ripening of the new crop, first and second pickings falling together in some cases, there has always been a heavy stock there, which reached the high record figure of over 2,840,000 cantars at the end of the year. The third picking was very small; in some districts there was none at all.

Crops and Cultivation in New Caledonia.

ACCORDING to consular reports for 1912 the French island of New Caledonia (area 7,200 square miles, population 50,600), thanks primarily to her mineral resources, seems to be coming more prominently to the front as a trade centre. Her exports of chrome ore in 1912, for instance, probably more than doubled the 1911 exports of 32,321 tons, but at the time the report was drawn up full particulars had not been received.

Of more interest to our readers are the agricultural exports of this island; that for rubber was dwindling. Produced from the *Ficus schlechteri* the exports decreased from 11 tons in 1911 to 8 tons in 1912. One or two plantations had been started, but the results have still to be made known. Cotton, on the other hand, seems flourishing; exports of 11 cwt. valued at £44 in 1908 increased to 3 tons worth £275 the next year, and to 197 tons valued at £15,536 in 1912. At present about 2,000 to 2,500 acres are planted. In good soil and with proper care the yields are abundant, we are told as much as 2,500 to 3,200 lb. seed-cotton per hectare (2.47 acres) being obtained, but in the most favoured spots and conditions this output is exceeded. At Havre the cotton realized in 1912 1s. 7d. to 2s. per kilo, but some Noumea cotton sold in Liverpool topped even 2s. per lb.

With coffee (about 3,700 acres planted) the *Hemelia vastatrix* was giving trouble and causing a decrease in the output, which amounted to 404 tons in 1912, including 34 tons from New Hebrides (which is under a joint Anglo-French administration), the whole valued at £33,100. Many plantations, possibly on account of the disease, are giving up *Coffea Arabica* for *C. Robusta*, which offers greater resistance to the disease.

The production of copra has increased from an average export of 1,547 tons in 1903-7 to 2,209 tons in 1908-12, the actual figures for 1912 being 2,814 against 2,941 tons in 1911. Most of this copra comes from the Loyalty Islands, and is shipped *via* Noumea to Sydney, Marseilles and Havre. Local prices ran in 1912 at £21 12s. to £22 12s., and the freight to Sydney was about 16s. per ton against £2 8s. 9d. to Marseilles. "Owing to the increasing demand for copra," writes Mr. Consul Holmes, "coco-nut planting is, I hear, receiving more attention than it did formerly. The tree, however, does not succeed so well in New Caledonia as in the Loyalty and New Hebrides groups, where the conditions both of soil and climate are far more favourable to its growth and productiveness.* Less suitable soil and a scarcity of labour are preventing New Caledonia from doing so well as these other centres.

WE recently had the pleasure of receiving a letter from Dr. Lucius Nicholls, co-author with Mr. Geo. S. Hudson of TROPICAL LIFE's prize essay on the "Fermentation of Cacao." The letter was dated from Mile 28, Magadi Railway, British East Africa, and in it the writer says: "It will interest you to know that the cacao fly (*Drosophila melanogaster*) exists out there."

* As regards the New Hebrides this is confirmed by the notes sent us by Mr. Thomas, Hon. Sec., New Hebrides British Association.—See TROPICAL LIFE, February, 1913, p. 24, or our book on Coco-nuts (13s. 6d. post free), pp. 434-436, with illustration.

Economic Zoology.

Our Motto—"Utilization, not Extermination."

FOLLOWING on the notes in our December issue on the profits to be realized from pigs' bristles by those who know how to prepare them for market, and study the prices they sell at over here, we now see by the *London Chamber of Commerce Journal* that those living in countries, especially India, China and Latin America, where, in the aggregate, huge quantities of horse-hair, cow-tail hair, goat, yak and even human hair, are obtainable, would do well to send samples to London for report and valuation, with the view of opening up a steady business in these side lines, the demand for which is extremely good, as such products always meet a ready market. Of course, as with pigs' bristles, the goods must be thoroughly cleaned, graded as to colour, length, &c., and must be thoroughly, very thoroughly dried, and carefully packed before shipment. All hair is sent over press-packed to save freight, but bristles must not be press-packed; when properly bundled they are fairly heavy and pack close, so leave but little room to waste. Those wishing to go into the trade should communicate with friends over here; if they have none and care to write to us and send samples we will do our best to place them with a merchant who will reply direct, and give fuller particulars than we can.

In our October issue we had reason to call attention to the wondrous ways in which the Customs officers at New York were interpreting the law with regard to the wearing of plumage by visitors entering New York City. Last month, according to the *Times'* correspondent, they stopped Mrs. Flora Annie Steel, the gifted authoress, who was travelling second-class, as she frequently does in her search for "matter," and, among other inquiries, wanted to know how much money she had, which was £100 "and more if necessary"; but when she added that she was an author the inspector looked dubious and bade her wait. An hour later he returned and informed her that the immigration doctor had certified that she was suffering from senile debility and that she could not be allowed to land as there was a danger of her becoming a public charge. She then told the officials that her account of the experiences she was having with them would be worth £30 in a London newspaper. This appears to have struck the officials as a slight proof of her sanity and, after questioning her for another quarter of an hour, they told her nephew to take good care of her, and released her. The extremists on this side who ask us to take warning of New York and her Customs regarding the "brutes" that wear feathers should also tell us about the above, as it clearly shows, if the *Times'* account is correct, the class of official that decides "Who's who" and "What's what" in the States. Over here one wonders what the police will do if a woman appears in the street with a wild bird's feather. How they will behave remains to be seen, but we trust they will not be as rough and as dense as some of the American officials seem to be.

Such conduct is what an old sugar driver we once knew would have called "mulish," which reminds us that the editor of our contemporary, *La Hacienda*, wrote us regarding what we said in November as to the possibilities of mules breeding, when we quoted a case

from the *London Field*, confirming a similar case from Brazil: "I am glad to see," the editor writes, "that you are inclined to agree with me on this matter, as I know that the subject of whether mules can breed or not is one which has been discussed a great deal, and one in which there is a wide diversity of opinion. The picture in question was sent in to us by one of our Brazilian subscribers, who offered the best of evidence that the event really took place, and that the photograph was authentic in every way. He added the statement that the colt was at that time thriving and strong. With all this even I would not have published the photograph but for the fact that fifteen years ago I heard the subject discussed in such a way that it left me fully convinced that such an occurrence takes place occasionally. I happened to be on the same steamer crossing over from Europe as the late Carl Hagenbeck, of Hamburg, one of the most interesting conversationalists it has ever been my pleasure to meet. He was telling of the results of his years of experiments in producing animal hybrids, especially crosses between lions and tigers, in his Hamburg Zoo, and in the course of his conversation remarked that while he had succeeded in breeding the first cross, he had never in the course of twenty years of trials been able to secure an offspring from this hybrid. He went on to say, however, that he had by no means given up hopes, and cited the instances in which mules had borne colts, stating that he personally knew of a great many cases, and, if I remember correctly, he himself had bred mules with success. He also mentioned that crosses between other animals had been known to bear offspring. Naturally, therefore, when, as with yourself, I hear the subject discussed, my memory harks back to these statements of Mr. Hagenbeck, who, I imagine, was as much of an authority on the subject as any one could be. It was my reliance on such an authority that induced me to publish the photograph, and with such confirmatory and authoritative evidence as we now have the question is of lively interest and importance."

Certainly this is a matter of great importance, especially to centres in Latin America and elsewhere, where mules have to be used instead of horses. What should have been done, and what can still be arranged, is for a firm like Hagenbeck's to collect together at a common centre, preferably in the Tropics, all young mules bred from mule mothers, in the hopes that, since peculiarities reproduce themselves, a strain of mules could be evolved which can be relied upon to breed regularly in the Tropics, and not in Kentucky, Buenos Ayres, and other distant centres, requiring the animals to be transported by steamers, with the most dire results to themselves. We say this as we have seen the mules landed, and the condition of some of them—generally the biggest and most spirited, who have protested violently against the confinement throughout the voyage—is often shocking. Others die, and are thrown overboard. In any case, if the mules could be bred from mule mothers in the Tropics, much loss of money to the owners would be avoided, whilst the animals would be spared much suffering which they do not deserve, for, as the *Chicago Tribune* stated in a very well written "Tribute to the Mule," he is a magnificent mountaineer, and possesses intelligence and common sense in excess of his parents, and yet is the most misunderstood animal in existence; neither understood nor appreciated.



"Tropical Life" Friend—No. 106.

JOSEPH FROUDE WOODROFFE.

WE became acquainted with "Our Friend" for this month owing to the mutual belief we possess in Brazil as a trading and producing centre, and our regret that the rising generation in this country has had life made too easy for them, so that they are loath to go abroad and "doing their country's work." Meanwhile other nations are up and doing, making hay whilst the sun shines, thanks to the millions we have poured into Latin-America (last year, 1913, saw £1,000,000,000 left behind), and which in the absence of adequate representatives on our part, is tending rather to benefit every other country but our own, which has been the chief backer of the bills up to the present. Until the Government of this country, and especially our Education Department, realizes how seriously the supplies of foodstuffs are being curtailed owing to the untrained public—untrained but not necessarily uneducated or impecunious—being unaware of the riches to be obtained from over-the-seas, so long will our young men remain here where they are not wanted and not go to the Tropics where their absence is a menace to our commercial supremacy. Give us agricultural colleges in the West Indies, and in Ceylon, and encourage through them individual planters to take up the cultivation of coco-nuts, cacao, cotton, oil-palms, and other economic products, and then the Malayan and other governments will no longer need to warn the public from investing in bogus companies, and our food supplies and imports of raw material would be assured in the future as in the past, by the privately owned estates as well as by the company-promoted concerns.

Believing in this, and having had eight years' practical experience of the possibilities of Brazil, Mr. Woodroffe is at present engaged in writing a book on the Economic Expansion of Brazil (that is not the title), and the developments of new industries or the

resuscitation of neglected ones, partly on account of the rubber boom and partly, perhaps mainly, because left to themselves the South American, and especially the Brazilian, can never make their country attain to the economic prominence that they can do and will do, once the European element gets well established there; and since this is so, Mr. Woodroffe does not mean to rest until he has persuaded a large number of Englishmen, by means of his book, to go to Brazil and take up planting and commerce with rubber only as a side issue. By doing so the output of Brazilian rubber will be maintained and the cost cheapened, but how this is to be done we must leave "Our Friend" to tell.

Through his mother, Mr. Woodroffe is a kinsman of James Anthony Froude, the historian, hence his second name. Born in 1880, "Our Friend" started his business life in an accountant's office, but the "call of the wild" soon seized him, which, perhaps, was only natural as one of the first governors in the West Indies was a Woodroffe, the family having been well known in Derbyshire since the days of Elizabeth, when a former Joseph Woodroffe was Lord of the Manor of Marston Montgomery.

The present-day Joseph, as stated, soon started on his travels. During the South African War he served with the 2nd Batt. of the Rifle Brigade; later he went to Lagos, on the West Coast, and took charge of one of the branches of Messrs. John Walkden and Co., returning home in 1905, and leaving almost immediately (in October) for Iquitos, Peru. Here he assisted in the reorganization of the business of J. Abensur and Co., rubber estate owners and traders, then fighting the French Rubber Co., "Cie. Commercial de Caoutchouc," for the rubber trade of the Rio Javary, and the commercial struggle continued until both houses came to grief over it. Left "on his own," Mr. Woodroffe started trading on his own account, spent one year in the heart of Equatorial forests with seventy-two men of his own as caucheros, and has had sole control of several large Brazilian Seringals in the neighbourhood of São Paulo de Olivença, and then accepted the post of accountant, which he occupied for three years, to the Peruvian Amazon Rubber Co., with whose name are associated many of the crimes which startled England a little time back, and many of which, we fear, are still in existence, although the Company itself is not.

Shaking the dust, or rather the mud, of the Putumayo off his feet, "Our Friend" moved on to a pleasanter atmosphere and surroundings, as he became cashier and book-keeper to the Madeira-Mamoré Railway Co., at Porto Velho, Brazil. He was also accountant to Suarez Hermanos and Co., of Bolivia, who dominate the rubber industry of that country.

During the course of his labours, either on business, pleasure, or on account of his thirst for knowledge, Mr. Woodroffe visited all the principal rivers of the Amazon basin around the centres where he found himself at various times of his career, during which journeys he acquired that intimate knowledge of the rubber industry, its drawbacks, its friends and enemies, and, above all, the enormous possibilities it has for further expansion if given equal chances with its rival in the East. How these chances can be secured we are to learn in Mr. Woodroffe's coming books, one to be published by Messrs. Methuen and one by ourselves.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 88-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

APRIL, 1914.

Cotton—Its Variations and Improvement.

WE all know that strenuous efforts are being made in India and elsewhere to improve and lengthen the staple of indigenous cottons, especially those produced by natives, so as to cause the buyers on this side to be more attracted to them owing to the fact that the longer or better staple is more suitable for their work. As a result of the various letters and inquiries received from our readers during the past six and twelve months we made the following notes, and as they may be of interest to others we reproduce them here. Among other centres from which inquiries came was Brazil, where one of "Our Friends" has recently taken up his residence as director or manager of a very large cotton estate, where an improved variety will be grown, and the cotton, oil, and oil-cake are all to be used for local consumption, unless indeed the area extends and the output increases to such an extent that there is a margin for export.

Meanwhile our notes run* :—

Cotton can be said to pay between latitudes 45° north and 30° south. As a proof of how cotton should pay to cultivate in India, provided some of the improved varieties were grown, Sir George Watt tells us that in 1866 India exported to Great Britain 1,847,759 bales (her record shipment). In 1899 this had dwindled to 77,297 bales only, increasing to 203,550 bales in 1903; at the same time the century closed with India, instead of exporting cotton goods as for-

merly, having become the largest single market for English manufactured cottons, its demands having been just under £20,000,000, and to-day the amount must be—certainly it should be—still larger. In choosing which kinds to experiment with (a very wise precaution before laying down extensive areas under cotton obtained from elsewhere) the planter must consider his own soil, climate, season, &c., compared with those that prevail whence his seed comes from and has done well (hence his cause of wishing to try a supply himself). "A microscopic study of the floss," says Watt (p. 30), "in structural and physical properties gives one of the most certain of all keys to the improvement of the staple. The influences of soil, climate, &c., on the growth of the cells, their periods of maturity, extent and nature of cellulose deposits, strength of the cells formed, their colour and silkiness, degree of twisting, &c., are all vital aspects that must be closely watched in relation to the requirements of the market or markets which the planter is working to supply."

Your ability to please the buyer again depends, or may depend, on the season of growth, which, according to the time required by the variety to be chosen to mature governs the date of planting, and may cause you to give up a kind that you are most anxious to produce for another that will mature, under the circumstances in which your estate is placed, quicker and better than the ideal variety you are forced to discard with so much regret. "It seems probable," says Watt, "that reaping a crop a little earlier than is customary or in some cases a little later, might effect vast improvements in the cotton." We can say that getting off a crop early not only often enables you to get to market before the bulk of your competitors and so ensures your realizing better prices, but it often avoids a bad attack of boll-worm or stainer pests, as the cotton is picked and gone before these or other plagues are old enough to trouble the plants. To get early or late varieties, or to ensure an even maturity of the bolls, and so a quick gathering and an even quality when the cotton is ready for market, flowers should be marked that are fully opened at one and the same time, then allowed to ripen into fruit, and the seed used only from them. Carried out for two or three crops, according to the object sought after, a marked difference should be noticeable in the ability of the cotton to mature to the date desired. In these days of standardization, whether rubber, cacao, coffee, cotton, &c., it is well to note that "there can be no doubt that spinners do not wish to receive one and the same staple from all producing centres. There are merits, apart from length, in almost every known cotton, which it becomes imperative to ascertain and develop." Planters often do not pay enough attention to the importance, certainly the financial advantage, of training the cotton to mature and be ready for picking as near the same day as possible. This, as already explained, can be helped by carefully noting the flowers that mature together and using only their seed; planting them in separate fields if necessary, especially when having to ensure the variety or varieties sought after being kept pure. Equal maturity means equal ripeness and quality of cotton; unequal maturity gives under- and over-ripe cotton of lower values that sells with a dragging demand, when a little care

* All, or nearly all the notes in this issue, are taken from Sir George Watt's "Wild and Cultivated Cotton Plants of the World," price 30s. net, postage extra (about 1s. 6d.), Longmans, Green and Co., 39, Paternoster Row, London, E.C., or TROPICAL LIFE Publishing Department.

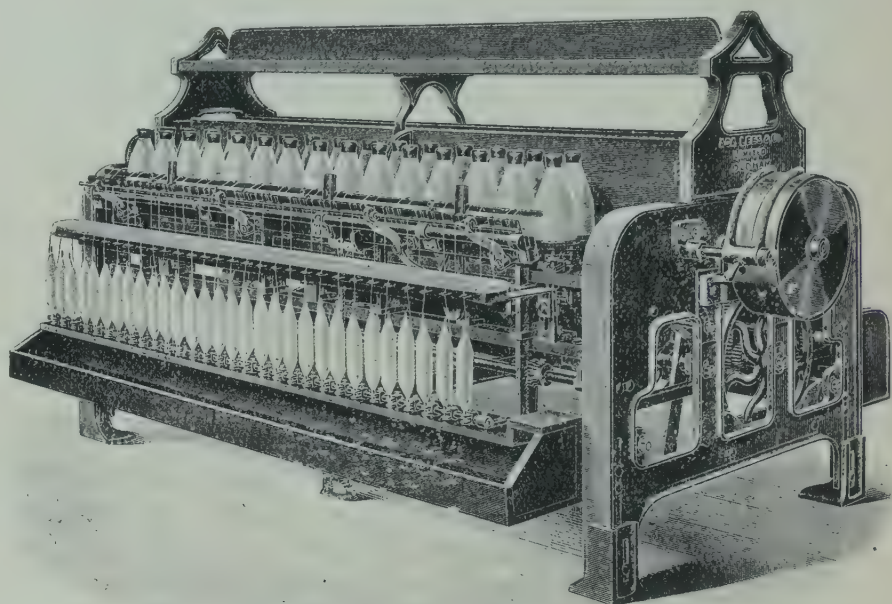
in seed selection would probably have sent your cotton galloping through the sales at full prices. Ripe or unripe, especially in centres where the labour supply is none too large, the whole of the cotton will probably be picked within the shortest possible time, and this being so, the planter can only choose that period of the plant's growth when the bulk of the cotton shows "a maximum of the so-called perfectly formed and spirally twisted cells" if examined microscopically.

We are, of course, sooner or later, to have agricultural colleges in Ceylon and the West Indies. When these come, especially the one in the West Indies, we feel sure that the local cotton planting industry will cause this article to receive prominent attention in the laboratory, the class-room, and experimental plots, and students (and teachers also) will be well advised to note the proportion of long or short-staple cotton in each of the various classes grown, as well as the variations in the fineness and general silkiness of the fibres, and to try and avoid the undesirable variations (which exist, we believe, in all varieties) as much as possible. Unless this is done the reputation of the planters' mark may suffer owing to variations in the quality without actual deterioration setting in on the estate itself. "I have seen enough," again quoting Watt (p. 35), "to satisfy me fully that, when cotton improvement is seriously embraced as a professional branch of operations in the world's supply of this commodity, selection will have to be made, in the first instance at least, on the basis of specific standards. It accordingly becomes imperative that a series of investigations, sufficiently comprehensive, should be conducted in the future with a view to establishing what might be spoken of as the standard measurements and physical characteristics of each recognizable botanical type. From some such record variability could readily be detected, and selection made with a view to preserving the stock and ensuring progression rather than retrogression." That something along such lines should be undertaken by an Institute of Research is shown by a remark of Dr. Bowman, who very truly observes that it is a well-known fact that from year to year, in any class of cotton, such as Egyptian, the degree of abundance of long or short-stapled cotton varies considerably as well as the quality of the fibre.

Cotton in Mexico.

ACCORDING to a consular report on the trade of Mexico for the year 1912 (that is, before the present disturbances upset its trade and agricultural industries), cotton was then the most important crop of the Laguna district in Mexico, the extent of the output being put at more than 100,000 bales in a good year. The area to be planted and the results which will be obtained depend almost entirely on the amount of water which the floods in the Nazas River may place at the disposal of the planters in the autumn of one year and again during the following summer. In the absence of any scheme of irrigation the local rainfall is insufficient and ill-timed for the growing of cotton, and want of rain in the mountainous watershed of the Nazas River, during either of the two seasons mentioned, prohibits planting or disastrously diminishes the yield. As a proof of how badly something on the lines of an Indian

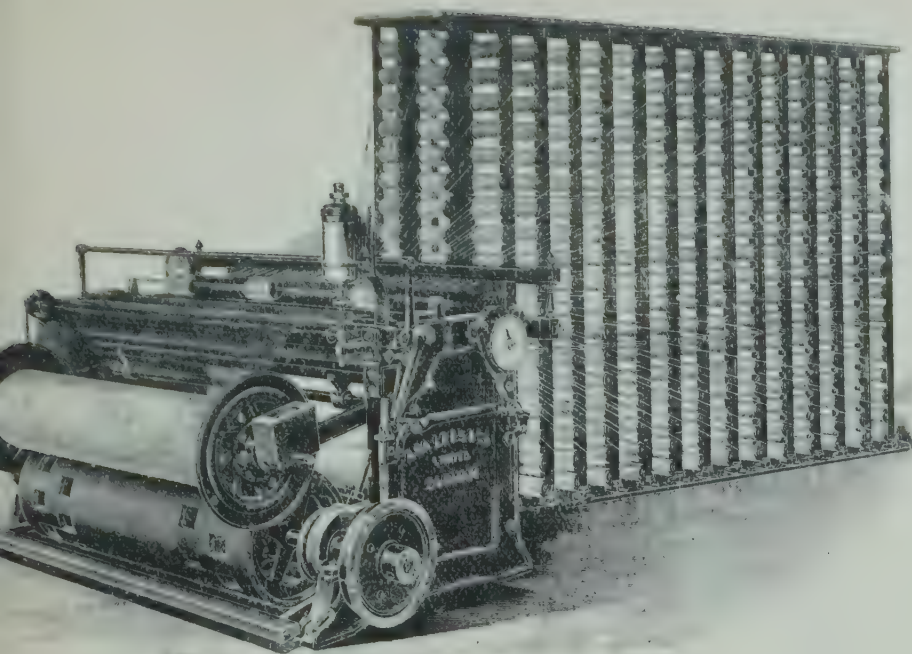
or Egyptian scheme of irrigation is necessary, we have only to mention that during exceptionally heavy floods it is not possible to utilize all the water, whilst at other periods, perhaps at the time of greatest need, the river bed is empty. Many proposals have been made with a view to retaining the water so that it may be distributed when it will produce the most benefit. A large dam, a few miles above Lerdo, promises best to satisfy the needs of the situation; extensive Government surveys with a view to the building of this dam were carried out before the present political troubles arose, but the disturbed state of affairs will, however, probably result in a postponement of the work for some years. Though examples are not wanting of those who have accumulated fortunes by cotton raising in this district, its speculative character cannot be ignored; but it certainly could, we should imagine, as regards troubles other than political, be minimized to a considerable degree, especially as there are several British subjects interested in cotton growing in this section.



A Cop Winding Machine for cotton yarns. Suitable for Mexican or South American factories. Messrs. Asa Lees and Co., Limited, Oldham, makers.

The average production per acre is about half a bale. The fertility of the soil is said to be maintained by the silt which the irrigation waters deposit; attempts to introduce chemical fertilizers have not been successful, owing perhaps to the conservative attitude of some planters, which may be ascribed to a want of conviction that by the aid of chemical manures they could add to their profits, and also to a disinclination to increase an investment, necessarily large owing to heavy unavoidable expenses, the main results of which must depend considerably upon conditions over which the planter has at present no control.

Seed in Mexico quickly degenerates, and experience has shown that it is advisable to import fresh seed every second year. The custom is to sow very thickly in the rows and to thin out the unnecessary plants; but we should imagine, since imported seed costs money, that it would be both cheaper and better to use drills and plant more evenly, for as American agricultural implements are generally employed, the latest methods for seed planting and the consequent cultivation between the rows, as well as between the plants, can



Beaming Machine for cotton yarn.

Another of Messrs. Asa Lees and Co.'s machines.

easily be ascertained by any pushing planter, that is, if he does not already know of them.

The cotton produced in the Laguna district is generally all taken by the mills of the Republic. The price obtained by the planter is based on the value prevailing at the time in the United States, to which are added the Mexican import duty on raw cotton, and the freight charges from the United States to Mexico; from this the freight charges between Torreon and the capital must be deducted, as well as, perhaps, a broker's commission; the result is from $1\frac{1}{4}$ d. to $1\frac{3}{4}$ d. per lb. in favour of the Mexican-grown cotton. All the large estates have their own cotton gins. The cotton seed is sold by the planters to the local soap works. A cotton compress has been established in Torreon.

The local mills consume a part of the ginned cotton of the Laguna district (operating some 50,000 spindles); however, the greater portion is sent to the large mills in the south of the Republic. Though the class of goods produced by the Mexican mills has shown during recent years considerable improvement, nevertheless the finer qualities of cotton cloths and prints are still imported from the United States and Europe. The mills, we are glad to note, are generally equipped with British machinery of which we are able to give three illustrations.

The Cotton Industry in Brazil.

PRODUCTIVE AND MANUFACTURING.

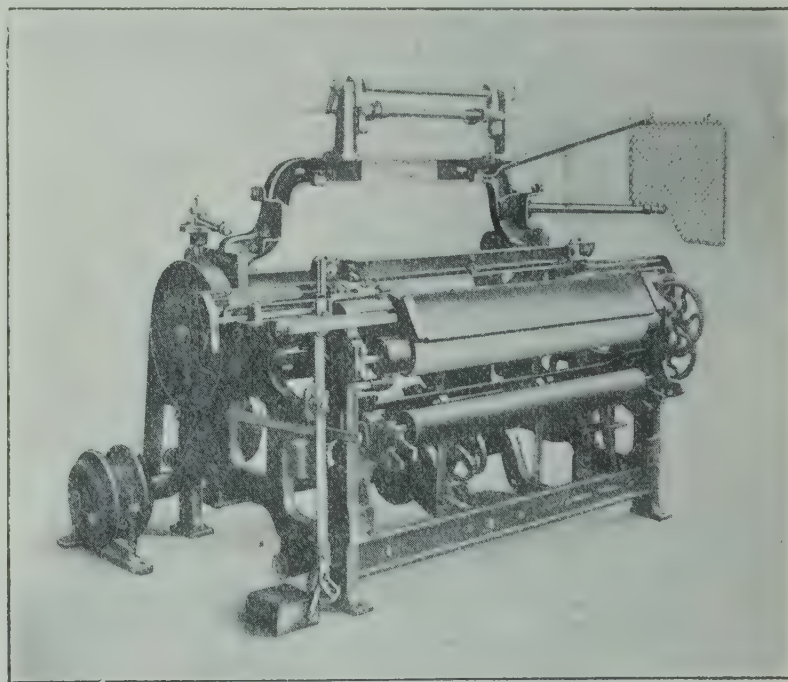
DURING the American Civil War the cotton industry was at its height in Brazil, but afterwards it went back, and it is only during the last two or three years that outsiders have realized how the country has recovered from the set-back it received from various causes, and what a marked step forward it has taken since 1904, when the not insignificant total of 165,000 bales of raw cotton was produced,* whilst in 1903 Sao

* Many of the details in this article are based on the excellent section on "Cotton," pp. 240-242 of Oakenfull's "Brazil in 1912." Robert Atkinson, Ltd., 19, Ludgate Hill, London, E.C. No price mentioned. Weight 14 oz.

Paulo City and its environs manufactured 37,000,000 yards of calico and cottons, using up 2,000 tons of raw cotton to do so. In 1911, although we cannot say the actual tonnage consumed for certain, we imagine it was somewhere round 14,200 tons, for we are told 6,600 tons of raw cotton were produced locally and 7,600 imported from Northern Brazil, all apparently going into the factories. The bulk of the cotton seems to be produced in the north-eastern coastal States, and it is claimed that it cannot be satisfactorily grown below Paraná or in the Amazon Valley.

The total production of cotton in the State of Sao Paulo was given as 21,996 tons (of 1,000 kilos) for the 1910-1911 crop, and Ceará is claimed to be one of the States best adapted to cotton production, although we know of at least one very large area being cultivated with English capital and under English supervision in Pernambuco, about twelve miles in from Natal, the capital of that State. According to Oakenfull, the average price of 10 kilos of Ceará cotton in 1911 was 15 milreis, or about 20s.,† equal to 2s. a kilo, or 1s. per lb., whilst that from Pernambuco and Alagoas was put at 11 milreis a kilo. In Ceará, we are told, the cost of land without a reservoir for irrigation is about 5 milreis a hectare (about $2\frac{1}{2}$ acres), which should produce cotton to the value of 824 milreis, or 550 kilos (say half a ton) in weight.

As regards the manufacturing side of the industry, the same authority tells us that three or four years ago (Brazilian figures are never up to date) no less than £12,000,000 sterling, or one-third of the industrial



A LOOM SUITABLE FOR WORK IN BRAZILIAN COTTON FACTORIES.

The "Everquick" Loom made by Messrs. Platt Bros. and Co., Ltd., Oldham, and exhibited by them at the (1913) Ghent Exhibition.

capital of the country, was invested in cotton mills, and that the Republic was still importing some £6,600,000 worth of manufactured goods. The latest returns (date not given) show Brazil to own 161 cotton mills, employing 45,942 hands; of these, five mills

† The cotton reports in TROPICAL LIFE for 1911, will, of course, give comparative values of other kinds in London and Liverpool.

alone in the district of Rio employed 8,000 hands and turned out 75,500,000 metres of cotton cloth, whilst four in Petropolis, close by, employ 2,500 hands and make 17,000,000 metres; some of the mills throughout the Republic are well equipped with dyeing and finishing machinery, and leading firms like our old friends, Messrs. Platt Bros. and Co., Ltd., and Messrs. Asa Lees and Co., Ltd., of Oldham, have been supplying the mills with ginning, spinning and weaving machinery for nearly forty years.*

We greatly regret the slump and set-back Brazil is experiencing at the present moment on account of so large an area out there being dependent on rubber, the inflated value of which during the past five or six years has caused other industries to be neglected in a manner that is now recognized as being as mistaken as it is mischievous. At the same time we hope and believe that good will come through the consequent pinch of poverty forcing both State and individual alike to desist putting all their eggs into the one basket, as has hitherto been done, and develop other industries, especially the cultivation of cotton, the manufacture of the lint into cloth, &c., and the expression of oil from the seed for human consumption, as well as a raw material for factories. Tobacco, sugar, and maize could also be extended with advantage; large areas could, with great advantage, be devoted to coco-nuts, whilst up the Amazon Valley, in spite of the incessant rains and flooded areas, we believe large areas could be profitably cultivated with oil-yielding plants as ground nuts, soya beans, &c., and certainly vegetables and ground provisions; but the cultivation of cotton and the spinning of the lint into cloth can be, and must be, always a prominent industry capable of substantial developments if the best use is to be made of those areas known to be suitable for its production.

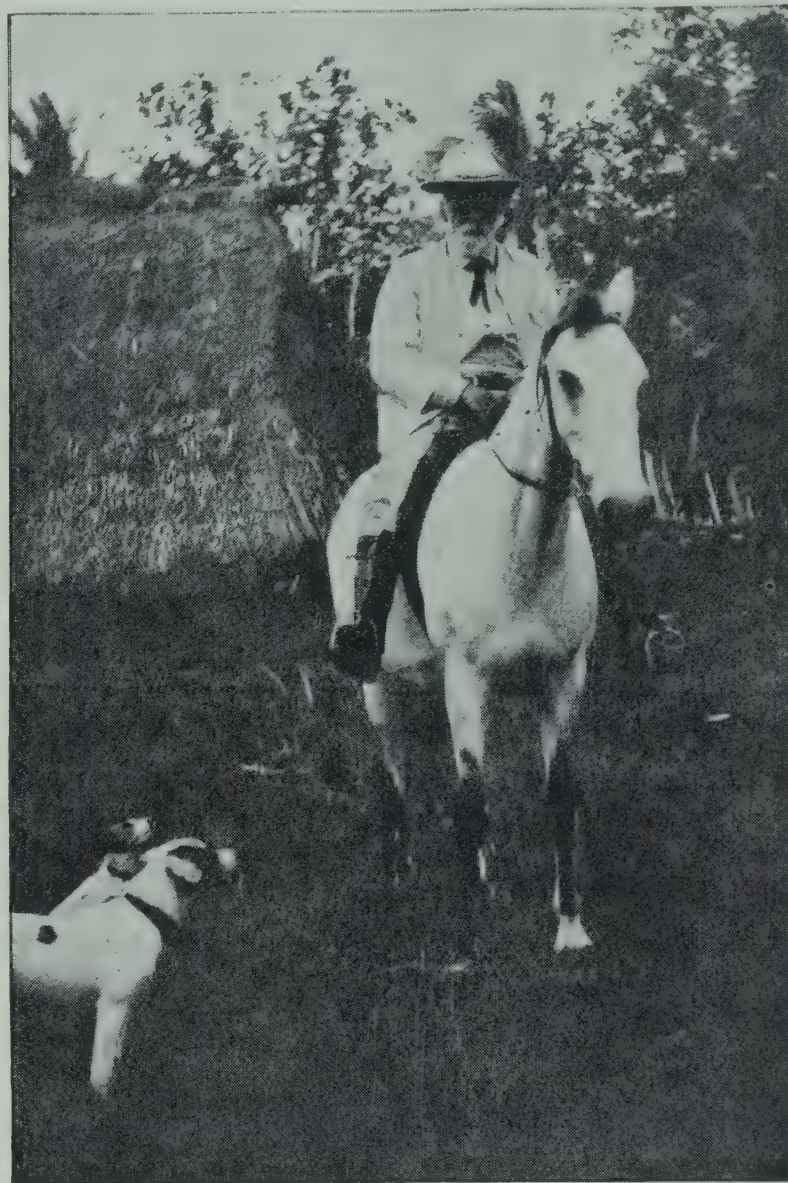
"THERE arrived in Singapore by the *Tomi Maru*," reported the *Malay Mail*, some time back, "a batch of 288 Manchurians from the north of China who are proceeding to one of the Japanese rubber estates in Johore. This is the first occasion on which any Manchurians have come down to Malaya to work, and they are said to be particularly fine men, whose physique compares very favourably with that of the ordinary coolies.

"A feature of our town life in this part of the world," the same paper tells us, "is the ever increasing number of motor vehicles used for the transport of goods and material. A good many firms now keep their own delivery vans."

* The history of the progress of this firm (Messrs. Platt Bros.) is as interesting as that of the Krupps in Germany. We believe that buried away in the midst of the vast German town is still the cottage inhabited by the original brothers to whom Germany to-day owes so much, although at the time she gave them so little. In the souvenirs published by Messrs. Platt in commemoration of the historical visit of King George and Queen Mary to their works on July 12th last, is included a portrait of Mr. Henry Platt (1793-1842), the founder of their firm, and a view of the small house in Oldham, in the upper floor of which he commenced business in 1821, when, assisted by five men, their first machine (to be more correct the first piece of mechanism), a carding-machine, was completed; to-day they employ some 12,000 hands, and besides their extensive works, saw-mills, &c., they own three collieries.

The Cost of Making Copra.†

WE owe the following important figures dealing with the cost of making copra in Fiji to the pen of Mr. H. H. Thiele, Secretary of the Fiji Planters' Association, whose series of articles on coco-nut cultivation we reproduced in our work on "Coco-nuts," where they occupy pp. 410-428. Those who have the previous articles can compare the figures therein with the following; and as Mr. Thiele's agricultural experience has extended from Denmark to Argentina before he put in twenty-seven years in Fiji, his opinions and statistics deserve the careful attention which we are sure they will receive.



Mr. H. H. Thiele.

To the Editor of TROPICAL LIFE.

Suva, Fiji.
January 2nd, 1914.

DEAR SIR,—Referring to an article which appeared some time ago in TROPICAL LIFE on "The Cost of making Copra," the following facts and figures may be of interest to some of your readers.

In Portuguese Africa it appears the planter spends something like £1,900 on labour, numbering some 200

† For former articles on this important question see TROPICAL LIFE, "Cost in Angola and Portuguese Africa," June, 1913, p. 103, or "Cost in Malaya," September, p. 164, or in "Coco-nuts, the Consols of the East," p. 410. TROPICAL LIFE Publishing Department, 13s. 6d., post free.

and earning about £750 per annum, and in looking after, i.e., supervising same. This appears rather out of proportion, though, of course, the less a labourer earns the more the supervision that is necessary.

Supposing I were to take over a coco-nut plantation with, say, 3,000 acres in full bearing in Tavenui, in Fiji, and put it in working order according to my ideas, in that case my calculations would be as follows:—

Each acre carries fifty trees, each tree will give 45 nuts* per annum, total 2,250 nuts, which, at 6,000 to the ton, equals .375 ton of copra from the acre.

From 3,000 acres I would get 1,125 tons of copra per annum; 1,125 tons = 2,520,000 lb. of dry copra, which (at 60 lb. of dry to 100 lb. of green)=4,200,000 lb. green copra.

One labourer will make during one year (260 working days at 300 lb.† per day) 78,000 lb. of green copra; on this basis fifty-four men (= 14,040 units at above rate) will produce about 1,125 tons of dry copra per annum, doing no other work.

The number of labourers (Indian coolies) with which I could work the plantation would be 150 (that is, 110 men and 40 women), who would work on an average: the men 260 and the women 220 days per annum. This would make a total of 37,400, "working units," of which 14,040 would be required for copra making, as shown above, leaving the balance, 23,360 units, for all other plantation work, including drying and shipping copra and looking after the cattle; this, I think, would be sufficient for that locality, provided a large enough number of cattle be kept so as to materially reduce the weeding expenses.

The working staff would be as follows:—

	Per annum
	£
1 manager	400
‡2 overseers (1 at £200; 1 at £150)	350
1 overseer (in charge of cattle, &c.)	180
4 sirdars (1 general work, 2 for men, 1 for women) ...	140
150 labourers (wages including introduction charges) ...	2,750
Other expenses;—	
Manures and dealing with plant pests	660
Insurance of and repairs to buildings	800
Renewal of and repairs to furniture, implements, &c. }	
§Hospital expenses and medicines	
||Loss on labour rations, and **capitation fees ...	200
Repair and renewal of tramlines	
Copra bags	605
††Freight to Suva on 16,875 bags copra at 1s.	845
Total	£6,930

A fair average price in Suva would be £20 per ton. (At present, and for some time back, it has been £22 and over.)

To the income for copra should be added the value

of, say, 400 head of fat cattle sold annually at £6 each.

Yearly statement.				£	£
By sale of copra	...	...	...	22,500	24,900
By sale of cattle	...	...	...	2,400	
To cultivation and sundry other expenses	...	...	...	6,930	8,930
To hurricane risks	...	...	...	2,000	
Balance	...	...	...	£15,970	

On a 10 per cent. basis the estate, inclusive of cattle (say 3,000 head at £3 6s. 8d. = £10,000), would be worth £160,000.

It should be mentioned that by shipping through to the Colonies or Europe a larger profit could be made out of the copra.

In the above you will find all the information of importance on this subject.—I am, Yours faithfully,
H. H. THIELE.

THE following has been recommended for manuring coco-nut trees by the Director of Agriculture, Travancore, where it is sold at the rate of about half an anna per pound:—

Groundnut cake	...	...	...	2	lb. per tree
Fish guano	...	...	...	2	" "
Bone-meal	...	...	...	2	" "
Kainit	...	...	...	2	" "
Pot. sulphate	...	...	...	½	" "
Salt	...	...	...	1	" "
Lime	...	...	...	1½	" "

Total ... 11 lb. per tree.

The manure should be mixed with sufficient earth before its application so as to ensure its even distribution in the ground.

MESSRS. A. F. CRAIG AND COMPANY, LTD., of Paisley, have added to their oil crushing and refining machinery for vegetable oils, the manufacture of refineries for coco-nut oil, to enable their customers to produce the well-known "Cocos-butter" used in the manufacture of margarine, biscuits, confectionery, toffee, caramels, chocolates, &c.

Butter absolutely neutral and tasteless, with a melting point varying from 70° F. to 90° F. can be produced by this method of refining, which is not a new process, but one that has been successfully used for years. The firm, therefore, is now in a position to offer complete plants for treating the coco-nut from the time it leaves the plantation to the turning out of finished butter.

Messrs. Craig are willing to refine samples of oil sent to them and will return the refined butter to show what the process is capable of doing.

* By the use of manures it is expected that the estimated yield of forty-five nuts per tree would be materially increased. We might also state here, that in Jamaica, B.W.I., Mr. Wm. Cradwick, the travelling instructor attached to the Agricultural Department, who is most reliable in his statements, claims very heavy yields for their trees on the rich alluvium soil near the sea. "It is," he adds, "when you get away from the sea on clay lands or poor soils that the yields fall off and spoil the average."

† The daily task per man is usually fixed at gathering, splitting, and cutting out 300 pounds of copra, bagging, carrying and spreading it on the vatas (drying platforms).

‡ The overseers keep the pay lists, and pay wages every Saturday. One of them also superintends the issue of rations, if no other arrangements have been made. Overseers get free lodgings, but not board.

§ The daily charge for each patient in the Government provincial hospitals is 2s. The large sugar mills and plantations have their own hospitals, under Government supervision. This is more convenient, and may be less expensive. An overseer usually attends to the out-patients on the plantation.

|| Adults are rationed for six months and children for twelve months after arrival. The Ordinance allows that from each adult 2s. 4d. per week can be stopped out of earnings: for children's rations nothing can be recovered. Children get half allowance only. The actual cost of a weekly ration is over 3s.

** The usual capitation rate is 2s. (payable to the Government) per head per annum.

†† The inter-island steamers, if given notice, will stop and take in any reasonable quantity of copra (say not less than a ton), and send their boats off for it.

Cotton.

THE following were the prices for Cotton in London on April 16th, according to Messrs. Slann and Davies:—

Davies :—		Compare											
		Good—Fair.		Good.		Fine.		Superfine.	Good, 1914.		Good, 1913.		
		d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	per lb.
Surat kinds *	...	5 $\frac{5}{16}$	to 5 $\frac{1}{2}$	5 $\frac{9}{16}$	to 5 $\frac{1}{2}$	5 $\frac{1}{16}$	to 6 $\frac{3}{32}$	—	6 $\frac{1}{8}$	to 6 $\frac{5}{16}$	5 $\frac{1}{2}$	to 5 $\frac{1}{16}$	—
Madras	...	5 $\frac{1}{16}$	to 6 $\frac{1}{16}$	5 $\frac{1}{8}$	to 6 $\frac{5}{16}$	—	—	—	5 $\frac{3}{4}$	to 6 $\frac{5}{8}$	5 $\frac{3}{16}$	to 5 $\frac{1}{16}$	—
Bengal	...	—	—	4 $\frac{3}{4}$	—	5	—	5 $\frac{1}{8}$	5 $\frac{5}{8}$	—	5 $\frac{1}{8}$	—	—
Assam	...	—	—	5 $\frac{5}{16}$	—	5 $\frac{1}{16}$	—	5 $\frac{1}{16}$	5 $\frac{3}{4}$	—	5 $\frac{5}{8}$	—	—
China	...	—	—	5 $\frac{1}{2}$	—	5 $\frac{1}{16}$	—	6 $\frac{1}{8}$	5 $\frac{7}{8}$	—	5 $\frac{7}{8}$	—	—
West Indian	...	7	—	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{4}$	8	—	8	—	—
Sea Island	...	11	—	14	—	17	—	20	15	—	14	—	—
West African	...	6 $\frac{7}{8}$	—	7 $\frac{1}{8}$	—	7 $\frac{1}{2}$	—	—	6 $\frac{1}{2}$	—	6 $\frac{5}{8}$	—	—
East	...	7 $\frac{3}{16}$	—	8	—	9 $\frac{3}{4}$	—	—	7 $\frac{9}{16}$	—	7 $\frac{1}{2}$	—	—

* Liverpool quotations.

Since the first week of April the market has continued to improve, and prices for American rose 17 points for Spot and about 15 for near Futures, but owing to realizations just before and after the holidays a good part of this advance has been lost, the rise on the fortnight being only about 7 and 8 points respectively. East Indian has been dull, with Spot unchanged, except that Bengals are reduced $\frac{1}{16}$ d. For arrival quotations are in some cases about $\frac{1}{8}$ d. per lb. higher.

The import into Liverpool this week amounts to 82,343 bales, since September 1st 3,723,495, same week last year 50,487, last year's total 3,870,063 bales. The estimated Sales amounted to 32,000 bales, including "called." Middling American is quoted at 7·28d. per lb., last year 6·88d., 1912 6·67d.

Movement of American Cotton since September 1st:—

	1913-14.	1912-13.	1911-12.	
Brought into sight	13,390,000	12,616,000	14,369,000	bales
Exports from United States since September 1st—				
To Great Britain	2,952,000	3,064,000	3,784,000	—
To Continent, &c.	4,350,000	3,863,000	4,948,000	—
Total crop	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C.:—

	April 16th.	Same time 1913.	Same time 1912.	
	d.	d.	d.	per lb.
April	6·93	6·63	6·43	—
April—May	6·84 $\frac{1}{2}$	6·59 $\frac{1}{2}$	6·39	—
May—June	6·82 $\frac{1}{2}$	6·59	6·39	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

Good supplies of East India were offered during the early part of April, and met with a good demand at generally steady prices. Costa Rica maintained previous rates, and other Central American kinds close without change; auctions were then suspended for the Easter holidays. According to Messrs. Düüring and Zoon, the stocks in the principal ports of Europe on April 1st showed an increase for the month of 353,000 bags, against an increase of 69,000 bags in 1913; the visible supplies showing a decrease of 185,000 bags, against a decrease of 348,000 bags last year. "Futures" have been easier on heavy receipts and lower Brazilian Exchange, and the latest price of May Santos shows a decline of nearly 2s. for the week.

We quote:—

	To-day	April 2nd, 1914
London ... Santos, May del.	40s. 10 $\frac{1}{2}$ d.	42s. 9d.
New York ... No. 7, Rio	8.49 cents	8.75 cents
Hamburg ... Santos	47 pf.	48 pf.
Havre ... Santos	58 francs	59 $\frac{1}{4}$ francs

The receipts at Rio and Santos from July 1st, 1913, to April 8th, 1914, were 12,564,000 bags, against 10,495,000 bags and 11,341,000 bags in the two previously seasons respectively.

Sales include the following, viz.:—

East India, viz., Mysore, 67s. to 79s. 6d. for fair to good smalls, 67s. 6d. to 85s. 6d. for low middling to fine middling, 71s. 6d. to 97s. 6d. for low middling to fine bold. Coorg, 62s. to 69s. for smalls, 67s. to 73s. for low middling to middling, 70s. 6d. to 78s. for bold. Neilgherry, &c., 62s. 6d. to 66s. for smalls, 67s. 6d. to 76s. for low middling to good middling, 75s. to 82s. 6d. for bold. Wynaad, 67s. 6d. to 72s. for low middling to middling, 73s. to 76s. for bold. Naidoobatum, 67s. for smalls, 75s. 6d. for middling.

Uganda.—At 50s. 6d. to 60s. for common to fine ordinary, 69s. to 72s. 6d. for bold.

Nairobi.—At 62s. to 64s. 6d. per cwt.

Java.—At 48s. for Robusta.

Costa Rica.—At 60s. to 73s. for fair to good smalls, 68s. to 80s. for fine ordinary to good middling, 73s. to 87s. for middling to fine bold.

Guatemala.—At 62s. for smalls, 63s. 6d. to 71s. for fine ordinary to good middling, 71s. to 77s. 6d. for bold, 107s. 6d. to 109s. for Maragogipe.

Salvador.—At 68s. to 69s. for low middling, 72s. for bold.

Mexican.—At 55s. for smalls, 57s. 6d. for ordinary, 71s. 6d. to 73s. for bold.

Vera Paz.—At 68s. to 84s. 6d. for fine ordinary to good middling, 75s. to 91s. 6d. for low middling to fine bold, 99s. 6d. to 114s. for Maragogipe.

Dumont Santos.—At 39s. to 40s. for smalls, 50s. 9d. for medium, 61s. 6d. for bold.

Sugar.

UNSETTLED weather in Cuba, report Messrs. Czarnikow, though it interfered but little with the crop, was accountable for a moderate improvement in this market, May Beet moving from 9s. 2½d. to 9s. 2d. to 9s. 3¼d. to 9s. 3d., but we must be careful not to attach undue importance to showers, or even a few days' rain. We have had to pay for mistakes in previous years, but it shows how steady the market was at the moderate level of 9s. 2d. for May Beet. Higher Cuban estimates, unprecedented receipts, stocks going up to unknown figures in Cuba, did not make the slightest impression, but a few showers were sufficient to raise values. Meantime the Cuban stocks have again increased 50,000 tons, the Island having produced 230,000 tons excess (1,462,000 against 1,233,000 tons), which have gone into stock (669,000 against 431,000), and that excess may, with favourable weather, be kept up until the end of the month.

The weather in Europe has rather retarded sowings, but the moisture in the fields will favour growth whenever the seed gets into the ground. No fresh news has come to hand regarding area to be sown. Germany does not expect any decrease, but rather the contrary.

The American market has been rather steadier in tone, with buyers where there were sellers, the quotation for 96 per cent. Centrifugals remaining nominally unchanged at 2.95 cents = 9s. c.i.f. New York. In the United Kingdom the tone for refining grades of Cane Sugar has been better, and owners of some parcels of arrived and near-at-hand Centrifugals have obtained a small advance. Grocery Crystallized has been in a slightly improved demand, but values are rather in buyers' favour. As regards cane-producing countries, mail advices from Brazil report that in Pernambuco, owing to heavy rain, the next crop will turn out much less than the last, which reached about 103,000 tons; in Campos a good crop is expected, fully equal to the last.

The total transactions for the week ending April 11th included some Crystallized Demerara, low middling grey to middling ditto, at 13s. to 13s. 3d. duty paid, middling palish yellow to good middling yellow, 13s. 4½d. to 13s. 9d.; good yellow, 14s.; fine bright ditto, at 15s. to 15s. 9d. Crystallized Trinidad, middling greyish to good middling palish yellow, 13s. 4½d. to 13s. 6d. Crystallized Jamaica, good dry pale, 13s. 6d.

In Liverpool, 8,512 bags grainy Peruvians changed hands at 9s. 11¼d. quay, Liverpool, and 9s. 10½d. floating, landing, Clyde, basis 96 per cent. polarization.

The India-rubber Market.

UP at Liverpool the Pará market has been very quiet during the week, and the values at the close are hard fine spot and April-May, 3s.; May-June, 3s. 0½d.; and June-July, 3s. 0¾d.; soft fine April-May, 2s. 11¼d.; Peruvian ball, 1s. 9¾d.; and scrappy negroheads, 1s. 9d. per lb. Medium Brazilian grades have been more or less idle. The African market has been firm, and the sales reported amount to 25 tons, including Conakry sheets and strings, 1s. 11d.; Conakry niggers, 1s. 8½d. to 1s. 9½d.; Lahou sheets, 1s. 10½d.; red

Assinee niggers, 2s. 3d.; smoked Benin Plantation, 2s. 9d.; selected Gold and/or Ivory Coast lump, 1s. 0¼d.; ditto rejections, 1s.; Assinee paste, 9½d.; Accra paste, 9d.; and Gold Coast niggers, 1s. 0¼d. per lb.

The London market for Pará has, generally speaking, been quiet, with only a limited business doing, but prices at the close show no quotable change from Friday last, Hard Fine closing at 2s. 11¾d., April delivery 2s. 11¾d. after sales at 2s. 11½d., May-June sold at 3s., and June-July at 3s. 0½d. Soft Fine is very quiet, with sellers on the spot at 2s. 11¾d., May-June delivery sold at 2s. 11¾d.

The market has been active since last sales, Messrs. S. Figgis and Co. tell us, and business has been done for spot and near at higher prices, but distant positions are rather neglected and are cheap.

For the auctions on April 7th and 8th 1,075 tons Eastern Plantation kinds met with keen competition, and everything sold, prices showing an advance of 2d. to 2½d. per lb. on Standard Crêpe, other grades not so much. Prices realized included Malaya Crêpe, fair to fine pale, dull to good palish, 2s. 8d. to 2s. 9d.; light brown and grey, part streaky, 2s. 5½d. to 2s. 7¾d.; fair to good clean brown, 2s. 3½d. to 2s. 6d.; dark and specky brown, 2s. 0¾d. to 2s. 4¼d.; dark and black, part pressed, 2s. 0½d. to 2s. 3d.; dark and black, inferior, 1s. 7¾d. to 2s.; dark to good smoked, 2s. 1d. to 2s. 6½d.; cured by "Byrne" process, dark to good (sheets 2s. 6¼d. to 2s. 7¾d.), 2s. 1½d. to 2s. 7d. Sheets, fair to very fine smoked (Highland, 2s. 8d. to 2s. 8½d.), 2s. 7d. to 2s. 8d.; damp, mouldy, and part smoked (one lot, 2s. 1d.), 2s. 4¾d. to 2s. 7d.; fair to fine unsmoked, 2s. 5½d. to 2s. 6¼d.; damp, mouldy, and stuck, 2s. 3d. to 2s. 5d. Block, fine pale Lanadron, 2s. 6¾d. to 2s. 7d. Scrap and Virgin, fair to good, 1s. 9½d. to 2s. 0½d.; mixed and inferior, 1s. 5d. to 1s. 8d. Rambong, Crêpe, 2s. 2d. to 2s. 2½d.; scrap and block, 1s. 11¼d. to 2s. 1¾d. Ceará, sheet, nothing offered. Ceylon, Crêpe, thick dull to fine (one lot, 2s. 9¼d.), 2s. 8d. to 2s. 9d.; fair to fine pale, dull to good palish, 2s. 8d. to 2s. 9d.; light brown and grey, part streaky, 2s. 6d. to 2s. 7¼d.; fair to good clean brown, 2s. 3½d. to 2s. 6d.; dark and specky brown, 2s. 1d. to 2s. 4d.; dark and black, part pressed, 2s. 1d. to 2s. 3¼d. Block, "Wickham" process, 2s. 6d. Sheets, fair to good smoked, 2s. 7d. to 2s. 7¾d.; damp, mouldy, and part smoked, 2s. 5d. to 2s. 7d. Sheets and biscuits, fair to fine unsmoked, 2s. 5¼d. to 2s. 6¼d.; damp, mouldy and stuck, 2s. 4d. to 2s. 5¼d. Scrap and cuttings, fair to fine, 1s. 9d. to 2s. 0½d.; mixed and inferior, 1s. 6d. to 1s. 8½d.

Manihot.—Lewa cut ball, 1s. 4d.

Mallendo.—Fine, 2s. 4d.; scrappy, 1s. 4d. to 1s. 5¼d.

West Indian.—Pressed sheet, 1s. 11¼d.; scrap and pieces, 1s. 4d. to 1s. 9d.

Meanwhile it is well to note that some one in authority in the Federated Malay States does not consider that the synthetic bogey is altogether dead, for we see by the *Indian Trade Journal* that in a report on the Federated Malay States for 1912, issued in the form of a blue book, it is stated that the Director of Agriculture, in dealing with the rubber industry, considers it advisable to warn planters that they must be prepared to face synthetic rubber as a competitor, a number of chemists in England and Germany being

engaged in working out this problem; and he observes that because the first announcement was premature the attitude that there is nothing to be feared is strongly to be deprecated. This statement has evidently been made because Mr. Eaton, the chemist of the Department, during a visit to Germany, was able to obtain samples of synthetic rubber which might be described as slightly inferior plantation Crêpe. The cost, he was informed, was about 2s. a pound. In his opinion there is no need to fear the competition of synthetic rubber for several years, whilst plantation rubber can be put on the market by well-managed estates at 1s. a lb. We have heard of nothing to confirm such fears, for we all have seen samples of the synthetic article from time to time. If a synthetic rubber likely to prove a serious competitor to the genuine article does crop up it may yet come, not from Germany, but from the invention of Kane and Mathews in England, on which Professor W. H. Perkin delivered his memorable paper on June 17th, 1912, before the Society of Chemical Industry, and with which the names of Sir William Ramsay and other scientists were coupled.*

Pará rubber statistics for the month of March (tons):—

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará ...	3,260	1,590	= 4,850	agst. 4,260	4,400	3,530
Shipments to Europe	2,060	760	= 2,820	„ 3,190	2,210	2,470
„ „ America	1,410	560	= 1,970	„ 1,800	2,680	690

Crop statistics—June 30th, 1913, to March 31st, 1914 (nine months):—

	Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10.
Pará {	1913-14	24,030	6,330	30,360	33,430	30,110	29,230
Receipts {	1912-13	27,100	6,330				
„ Shipts. Europe	12,770	3,650	16,420	18,620	15,530	15,150	15,590
„ „ America	11,210	2,470	13,680	15,990	16,150	10,530	15,300

Coco-nut Products, &c.

THE middle of March passed, according to Messrs. Mordaunt Bros., with prices for coco-nut oils tending lower all round, and very little business doing. During the week ending March 21st prices went down another 10s. to 15s. a ton (6d. to 9d. cwt.), and at that time it did not seem as if the bottom of the market was yet in sight, but the check came during the following week. It is true that prices dropped a further 15s. to 20s. a ton, but at the price then established a better demand arose, which raised values 5s. to 10s. above the lowest, but between then (March 28th) and mid-April values went back owing to the poor demand, until on April 18th they were quoted as under:—

Palm oil (Liverpool):	1914	1913	1912
Per cwt.			
Lagos ...	31s. 6d. to 31s. 9d.	31s. to 31s. 6d.	28s. 6d. to 29s.
Benin ...	29s. to 29s. 6d.	29s. to 29s. 3d.	27s. 3d. to 27s. 6d.
Congo ...	25s. 3d. to 25s. 3d.	26s. to 26s. 3d.	25s. 6d.
Bleached ...	32s. 6d. to 33s. 6d.	33s. 3d. to 34s.	31s. to 31s. 6d.
Clarified ...	30s. to 31s.	29s. to 30s.	28s. to 28s. 6d.
Palm kernel oil	39s. 6d.	42s.	35s. 9d. to 36s.
Coco-nut oil:			
Cochin ...	51s. 6d.	50s. 6d.	43s.
Ceylon ...	43s. 6d.	45s.	41s. 6d.
English pressed	39s. 3d.	41s. 9d.	35s. 6d. to 36s. 6d.
Copra oil:			
Ceylon ...	None	None	38s. to 39s.
Cochin ...	50s.	None	42s. 6d.

* See TROPICAL LIFE, July, 1912, p. 133.

According to the *Public Ledger* of April 12th, prices ruled as follows (per ton):—

Soya Oil.—Hull: All positions, £26 12s. 6d. sellers. Oriental (in cases) afloat, £25 12s. 6d. c.i.f.; February-March, £25 12s. 6d. c.i.f.; March-April, £25 15s. c.i.f.; April-May, £25 17s. 6d. c.i.f.; May-June, £26 c.i.f.; June-July, £26 5s. c.i.f. Antwerp.

Coco-nut Oil steady. Ceylon spot, £43 10s.; March-April, £41 5s. c.i.f.; May-June, £41 5s. c.i.f. Cochin spot, £51 10s.; April-May, £43 10s. c.i.f.

China Wood Oil.—London spot, £28 15s.; March-April, £27; April-May, £27 c.i.f.

Palm Oil.—Lagos on spot, £36.

Palm Kernel Oil.—Prompt, £39; April-June, £39 f.o.b. Hamburg.

Soya Oil Beans quiet. Parcels spot, £8 2s. 6d., afloat, £8 2s. 6d.; March-April, £8 3s. 9d.; April-May, £8 3s. 9d.; May-June, £8 5s.; June-July, £8 7s. 6d.; July-August, £8 8s. 9d. Hull.

Linseed Cakes.—London made, £7 10s. to £7 12s. 6d.

Cotton Cakes.—London made, £4 15s. to £4 17s. 6d.

Copra.—After a fair business at irregular prices the market closes quiet at barely steady rates, the following being the latest quotations: Malabar, March-April, £28 sellers; April-May, £28 Hamburg. Ceylon, April-May, £27 12s. 6d. sellers Hamburg. Java, February-March, £26 12s. 6d. sellers, and March-May, £26 12s. 6d. Holland, Hamburg, and Bremen. Macassar, January-March, £26 10s. sellers Holland, Hamburg, and Bremen. Singapore, April-May, £26 7s. 6d. paid Hamburg. Cebu, April-May, £26 5s. sellers. South Sea Island, March-April, £26 sellers London. F.M. Straits, April-May, £26 buyers Marseilles. Manila, April-June, £25 10s. sellers Marseilles. Mixed no Padang, January-March, £25 10s. sellers; March-May, £25 10s. Marseilles, all c.f. and i., delivered weight.

The London Cocoa Market.

BY THE EDITOR.

Two facts were driven home rather forcibly during the first part of April to those who were trying to keep up the price of cocoa, or who were gravely assuring their friends that prices were unlikely to go lower just yet; the first fact was that Havre had 81,000 bags of Accra cocoa on March 31st (quite enough for the total of an ordinary stock in London as a rule), and the second that Trinidad shipped 35,960 bags of cocoa in a single fortnight (ending March 14th). The truth is not always pleasant, and such truths at the present time are by no means appreciated by those having Grenadas, St. Lucia, and "Other W.I." on hand for sale. On the other hand, the heavy export months from the Gold Coast generally come to an end with February, and the climatic conditions which have been prevailing throughout the West Indies of late are not likely to encourage a heavy June output, whilst the San Thomé stock at Lisbon fell away nearly 19,000 bags during March. An unknown quantity is still Bahia, but although the floods there did serious damage where they occurred, especially along the Rio Pardo, the actual output up to now has certainly shown no signs of being adversely affected; whether the loss of the trees referred to in the next sentence

will be noticeable later on remains to be seen. A friend in Rio wrote as follows regarding the disaster: " . . . such enormous inundations with the continued storms and incessant rains that accompanied them for days together must cause damage even on my land, which is right up the Jequitihonha River; but those along the Rio Pardo came off badly indeed, for some of the planters lost everything they had, I am told, and have been reduced from assured prosperity to actual poverty." Whatever effect, therefore, the floods may have on the total output, there is, unfortunately, no doubt that some of the individual planters have suffered very seriously, especially where "houses, cattle, and entire plantations were swept away, for where the trees were not uprooted they were choked up with sand from the river." As we said last month, the sufferers have our most sincere sympathy. We can only hope that, as time goes on, the trouble may be remedied to a greater extent than seemed likely or possible when our friend wrote.

Going back to supplies and stocks, I had better give the figures before going on to other matters, since the stocks, until they are reduced a little, must help to keep the market dull and uncertain. Taking Lisbon first, Messrs. Martin, Weinstein and Co. report that the March figures were as follows:—

			Bags
Stock at Lisbon on February 28th	...	...	138,308
Add landings during March	...	...	36,876
		Gives	175,184
Deduct March deliveries	...	...	55,535
			119,649
Leaves stock on March 31st, 1914	...	...	119,649
Against	"	"	1913
"	"	"	1912
			142,445
	1914.	1913.	1912.
<i>London Stock, April 11th—</i>	Bags.	Bags.	Bags.
Trinidads	6,570	5,486	7,268
Grenadas	14,910	10,536	15,990
Other W.I.	4,006	2,964	7,854
British Africa	16,629	8,801	13,155
Portuguese Africa	4,138	7,349	5,489
German Africa	2,479	7,006	5,789
Ceylon and Java	10,616	23,730	17,649
Guayaquil	29,636	15,389	42,340
Brazil and Bahia	620	1,371	3,111
Other Foreign	8,461	8,386	7,522
Totals	98,065	91,018	126,167

	1914	Value.	1913.	Value.
<i>Havre Stock, March 31st—</i>	Bags.	Fcs.	Bags.	Fcs.
Pará	8,151	78 to 84	13,306	84 to 90
Bahia	15,073	71 " 78	16,286	86 " 92
Venezuela	41,136	74 " 200	20,248	87 " 200
Trinidad	24,914	72 " 78	18,029	86 " 92
Grenada and O.W.I.	1,923	74 " 79	3,849	80 " 90
San Thomé	7,252	76 " 80	10,788	88 " 90
San Domingo	813	68 " 75	8,209	74 " 76
Haiti	10,270	62 " 75	8,145	71 " 76
Accra kinds	81,036	68 " 72	58,679	77 " 81
Guayaquil	27,979	73 " 80	22,274	92 " 98
Others	10,284	—	9,071	—
Totals	228,831 bags		188,884 bags	

Liverpool has also been busy during January-March, for I see that her deliveries (224,781 bags) exceeded her landings (209,560 bags) by 15,221 bags, and as her invisible stock at the end of last year was 110,652 bags, she must now have some 95,000 besides 7,000 bags published stock at the bonded warehouse.

Coming to consumption, I was sorry to see that March did not again show a substantial increase over last year, that month's figures, as regards deliveries for home consumption, on the contrary, being 58 tons less

(2,315 tons, against 2,503 tons in March last year); this gives the three months' total as follows:—

	Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Mar. 31st). Tons.
Jan.-Mar., 1912—	13,200	6,628	1,482	14,618	
" 1913—	12,809	7,481	2,101	12,171	
" 1914—	15,839	8,898	2,127	14,915	
	Incr. 3,030	Incr. 1,417	Incr. 26	Incr. 2,744	

The foreign manufactured, on the other hand, after having suffered a setback for two months, took a spurt forward during March, say:—

	Foreign Manufactured—	Landed. Tons.	Del'd H.C. Tons.	Jan.—March.	Del'd H.C. Tons.
1914	1,088	1,578	2,644	2,713 tons	
1913	958	957	2,928	2,865 "	
1912	862	917	2,566	2,776 "	

Against this the French consumption for the two months January-February were 4,375 tons, against 3,918 last year, and 4,155 tons in 1912. The stock of cocoa in all France was 20,174 tons at the end of February (against the United Kingdom stock 10,940), as compared with 17,951 tons (English) in 1913 (United Kingdom stock, 11,217 tons). Talking of consumption, I see that the Hamburg *Gordian*, always to the fore as regards cocoa statistics, gives in the issue of March 25th (No. 454) the following figures of the world's production and consumption of cocoa for the years 1904 to 1913 inclusive. Twenty-three specified and "Other lands" are given for producing centres, and twenty consuming centres and "Other lands" for consumption, of which the following are the totals:—

Tons of 1,000 kilos.	World production.	Increase = +* or decr. = - per cent.	World consumption.	Increase = +* or decr. = - per cent.
Jan.-Dec., 1913—	255,600	+ 9.2	251,600	+ 0.8
" 1912—	234,438	- 2.9	249,703	+ 8.3
" 1911—	241,446	+ 9.7	230,474	+ 14.8
" 1910—	220,149	+ 6.6	200,656	+ 2.7
Skip to				
" 1904—	150,910	+ 19.2	139,372	+ 13.4

* Over previous year.

As regards consumption, the table shows an unbroken increase since 1903 of 76.2 per cent. The production shows a net increase of 76.9 per cent., but had two set-backs (1905 of 4.2 per cent., and 1912 2.9 per cent.), so that its 84 per cent. had to be reduced 7.1 per cent. = 76.9 per cent. net gain. As regards the balance between consumption and production, I should imagine these about right, and can even allow for further cultivation, especially as the older centres are liable to set-backs the world output only being maintained, thanks to the Gold Coast and newer centres.

The output of Guayaquil cocoa continues to be very heavy, all the same the 1912 receipts have almost gained up with this year. It will, however, be remembered that in spite of the start that 1912 got over 1913, in the end the receipts last year (854,300 qtls.) exceeded the 729,300 qtls. received in 1912, which crop was also behind 1911 and 1910 (804,500 and 748,500 qtls. respectively). This is a point worth noting, otherwise just as you think you will be inundated with supplies and arrange accordingly, the receipts fall away unexpectedly just when you do not want them to do so. The total receipts to mid-April at Guayaquil (as against the final outputs shown above) compare with this year as follows: 300,000 qtls., against 100,000 last year, 288,000 in 1912, 160,000 in 1911, and 75,000 qtls. in 1910. When one sees how very small the 1910 and 1913 figures were compared with 1912, it is difficult

to believe that they finally came out in excess of that year. It is for this reason that we warn buyers not to place too much reliance on the present huge shipments continuing throughout the year. As regards prices of this growth, I understand that the Association in Guayaquil which is elected to regulate prices as far as possible, claim to have some control on the market, so that it (*i.e.*, I take it, Guayaquil) will not break away too suddenly and disastrously, but if a drop does come, it will come gradually. This is more than can be said of Grenadas, which cannot be valued at more than 57s. to 59s. to-day (April 18th), and tend lower rather than higher. The shipments of this growth, the same as with Trinidads, have been liberal, but letters to hand from the West Indies of late complain of the weather, one correspondent feeling that this was so much against the June output that he wished he could afford to buy up the West Indian output for a month, as the cocoa thus accumulated would, he felt sure, go considerably higher. Whilst showing how dissatisfied my friend was with the weather, I cannot help feeling it is a good thing for him that he cannot afford to run a "spec." such as he describes. Meanwhile, these islands shipped the following up to March 30th:—

Oct. 1st-March 30th	1913-1914	1912-1913	1911-1912
Trinidad shipments ...	165,591	107,108	146,889 bags.
Grenada ,, ...	48,500	42,302	56,533 ,,

Including business done over the Easter holidays (April 10th to 13th), the following are about present values. In some cases, Grenadas especially, prices realized have been very irregular, 1s. and even 2s. difference being noticeable in some of the piles, practically equal in quality, that have been sold on the same day. Prices now quoted should be compared with those printed at the conclusion of the February and March issues, so that the fall in values, month by month, can be fully realized:—

Trinidads.—One of the last transactions reported was the sale of some 700 bags good red Trinidads at 63s. Previous to this a small lot sold at 61s., whilst good mid. red is valued at 60s. 6d. to 61s., and fine to superior marks 62s. to 64s.

Grenadas.—Whatever this growth has been selling at, good to fine marks are only worth 57s. to 59s., common unfermented to fair fermented 53s. to 56s.

St. Lucia.—Fine last sold at 60s., unfermented at 55s., but present values are 2s. below these.

Jamaicas.—Good red sold at 61s., and fair reddish 56s. To-day I value these at 59s., and 53s. to 55s.

Dominicas.—Have not been selling lately. I value fine marks at 56s. to 57s., common unfermented down to 53s.

St. Vincent.—Fiery red sold at 66s. 6d.; common unfermented at 50s.

Bahia.—Superior, rather mixed, sold at 61s. 6d., against 60s. to 61s. for fine Grenadas.

Cameroons are quoted at 58s. to 60s., against 60s. for San Thomé, and the following for Accra kinds.

British African has been selling up at Liverpool as low as 49s. for common cure, good red up to 54s. Importers, however, complain that the market is dull and dragging, buyers showing no wish to operate.

Guayaquil.—Arriba is valued at 61s. to 68s., and fine sold at 68s., with greyish Caraquez at 58s. to 59s.

Ceylons.—Fine bold is worth anything from 80s. to 83s., although lately the bids have been below this; fair to good medium and bold, 72s. to 75s. or 77s.

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. X.—No. 5.]

MAY, 1914.

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Our Books.

THE latest press notices on our last two books, viz., "The Fermentation of Cacao," and the second edition of "Coco-nuts—the Consols of the East" will be found on advertisement pages xxviii and xxxiii, to which we must refer our readers. Our best thanks are due to our contemporaries for their kindly remarks in the many important reviews that the books have received.

The Coming Congresses on Tropical Agriculture.

"TROPICAL LIFE'S" SHARE IN THE PROCEEDINGS.

THE coming summer will be a busy one for those interested in tropical commerce and agriculture who find themselves in London during June and July, especially if, in September, they are also able to visit Java. From Tuesday, June 23rd, to June 30th, the Third International Congress of Tropical Agriculture, under the presidency of Prof. Wyndham Dunstan, C.M.G., &c., will be held at the Imperial Institute, London, of which the president is director. From June 30th to July 7th the Rubber Congress and Cotton, Fibres and Tropical Products Congress will be held at the Agricultural Hall, London, whilst Batavia is to hold hers from September 7th to 12th, on the occasion of the Java Rubber Exhibition. Finally, at the ninth International Dry-farming Congress, to be held in Wichita, U.S.A., in October, we hope to be represented by a paper on "The Progress of Dry-farming Methods in the Tropics."

TROPICAL LIFE, therefore, is anticipating a busy time on ahead: busy and pleasant, for we are contributing papers to each of the above, as we now show.

Papers sent in to the International Congress, under Prof. Dunstan, include three on education as follows: "Technical Education in Tropical Agriculture," by Heer Lovink, D.A., * Netherlands, East Indies; "The Necessity of Establishing a British Tropical Agricultural College in the Western Empire," by the Editor of TROPICAL LIFE; "Agricultural Education on the Gold Coast," by Mr. W. H. Patterson. Other papers accepted relate to:—

Cotton, by Mr. J. A. Hutton, Chairman of the British Cotton Growers' Association; Mr. P. H. Lamb, D.A., Northern Provinces, Nigeria; Mr. G. A. Gammie, Cotton Specialist to the Government of India; Mr. H. Martin Leake, Economic Botanist, U.P., India; Mr. Lawrence Balls, of Egypt; Mr. Henderson, of Sind; Herr Moritz Schanz, of Chemnitz.

Fibre, by Mr. F. A. Stockdale, D.A., Mauritius; Dr. Bruck, of Germany, and Mr. A. Wigglesworth.

* Director of Agriculture.

Rubber, Mr. T. Petch, Mr. E. E. Green, Prof. Carmody, D.A., Trinidad, B.W.I., Mr. Ashmore Russan, M. Cheneveau, M. Marquis, Prof. Heim (Permanent Secretary of the International Association), and others.

Cacao, by Mr. Tudhope, D.A., Gold Coast; Prof. Carmody, Mr. W. H. Johnson, D.A., Southern Nigeria; Messrs. Booth and Knapp, of Messrs. Cadbury Bros., Ltd. (Mr. Knapp is the author of the articles on "The Fermentation of Cacao" now running in TROPICAL LIFE) and others. Besides the above, we hope to have a paper on "Forestry in Nyasaland," from Mr. Purves, Chief Forest Officer there; on "Palm Oil in the German Colonies," by Mr. Hupfield, Director of the German Togo Co.; on "Sugar Cane," by Dr. C. A. Barber, Government Sugar-cane Expert, India; on "The Economic Resources of the Sudan," by Mr. H. P. Hewins, Khartoum, and on Somaliland, by Dr. R. E. Drake-Brockman.

At the London Rubber Congress we hope to discuss "The Manuring of Rubber," with side notes on wider planting, inter-crops, &c., and show actual cost per lb. of rubber obtained expended by companies paying good dividends, together with prices realized by the rubber, thence profit accruing to the shareholders and owners when the land is adequately manured and cultivated.

The Batavia programme will include a paper by the Editor of TROPICAL LIFE on "Farming with Dynamite," and papers on "Rubber," by Prof. Went, of Utrecht; Mr. Henry C. Pearson, of the *India-rubber World*, New York; Prof. Baur, Berlin; Dr. Cramer and Dr. Van Hall, both now in Java; Mr. Sharples, of the Agricultural Department, Kuala Lumpur; Mr. de Jong, Dr. Ultee, Mr. B. J. Eaton, whilst Mr. Hamaker, Mr. Skinner and others will discuss planting distances and thinning out. Dr. de Jong, "Artificial Fertilizers and Green Manures"; "Rubber Testing" will be treated by Mr. G. G. Fol, of Delft, who has most carefully studied the subject, Mr. B. J. Eaton, Dr. Tromp de Haas, &c.; whilst "Rubber Costs" will be introduced by Mr. Vervooren, Java, and Mr. Macfadyen, Federated Malay States.

The (1914) Rubber and Tropical Exhibition and Congress.

UNDER THE PATRONAGE OF H.M. KING GEORGE V.

PROBABLE PROGRAMME OF EVENTS (*but dates not guaranteed*).

June 23rd (Press Day, in the afternoon).—The Rubber Growers' Association are presenting the Press representatives with hot-water bottles, in readiness for the winter, made from plantation rubber by the North British Rubber Co.; the Penang Rubber Estates present tobacco pouches made from their plantation rubber; the Dunlop Co. are giving a box containing a set of three golf balls; the Continental Rubber Co. are also making a presentation; and two American firms are making some novel gifts. So the gentlemen invited for that occasion will go away loaded with mementoes of the rubber industry, and all articles of use.

June 24th (Wednesday).—Opening of the International Exhibition of rubber and rubber goods, cotton, fibres and tropical products generally, by H.R.H. Prince Arthur of Connaught.

The Exhibition will open at 10 a.m. and close at

9 p.m., except on the opening day, when the public will not be admitted until after 4. The opening ceremony, as stated, will be performed by Prince Arthur of Connaught, at 3 o'clock, and The Right Hon. Lewis Harcourt, M.P., Secretary of State for the Colonies, will also speak.

The cost of arranging the Exhibition and its general installation will not be far short of £10,000. The handbook, though it will still only cost 1s., will run into about 1,000 pages of useful information, and, we understand, will be priced at 5/- after the Exhibition is closed.

June 25th (Brazil Day).—Reception by the Brazilian Delegates.

June 26th (British Malaya Day).—Reception by the Commissioner for British Malaya. Official visit by the Right Hon. The Lord Mayor and the Sheriffs of the City of London.

June 27th (Belgium Day).—Reception by the Belgian Commissioner, when His Excellency the Belgian Minister will pay an official visit, and probably also the Belgian Minister for the Colonies.

June 28th.—Trip to Brighton. Delegates, Commissioners, &c., from British and foreign countries, also English residents. Special Pullman train; lunch and dinner at the Hotel Metropole. Tickets 21s. This will be to Delegates only, as actual cost exceeds this sum.

June 29th (Ceylon Day).—Reception by the Ceylon Commissioners. In the evening: Banquet given by the French Delegates.

June 30th.—The Conference begins. Reception of the Delegates by Sir Henry Blake, G.C.M.G., &c., President. The Right Hon. Lewis Harcourt, M.P., Secretary of State for the Colonies, has promised to attend and deliver an address at one of the sittings of the Conference. The Conference will be reported fully, and all functions in connection with it, and the report of the proceedings will be published as soon after the close of the Exhibition as possible, price 15s. 6d. French Day in the afternoon: Reception by the French Commissioners, and official visit of the French Ambassador. Evening, 8.30: Reception by the Rubber Growers' Association, London.

July 2nd (Sudan Day).—Reception by the Sudan Government.

July 3rd, 4 p.m.—Reception by Messrs. McMeekin and Co. of the shareholders of their Companies.

July 7th.—Fourth International Rubber Banquet. Afternoon: Lecture by Monsieur Aug. Chevalier, Delegate in Paris of the Governor-General of Indo-China; on the results of his mission to the plantation countries of the East.

THE Chairman of the Chilaw District Planters' Association expressed himself as optimistic with regard to the price of copra at a meeting held on February 9th, when he pointed out that crops for 1914 had already been bought up at Rs. 95 (per candy of 565 lb.) and prices might go higher. "Twice he had been wired to to sell his crops at Rs. 95, but he declined, feeling that we would do better later on. Last year prices started even lower, but all know what values went up to." As shown on p. 63 in our April issue, whilst Ceylon prices of copra started in January, 1913, at Rs. 89, the price rose to Rs. 106 later on in the year.

The Practice of Cacao Fermentation.

By ARTHUR W. KNAPP, B.Sc.Lond., F.I.C.,
B.Sc.Birm.

(Continued from p. 62.)

PART III.

APPENDIX A.

THE MASS OF BEANS MUST BE KEPT WARM.

The temperature is the most important factor in securing a good fermentation. It is sometimes stated that there is a danger of the temperature rising too high, say above 60° C. (140° F.), but 51° C. was the highest temperature I found in Trinidad, and this is not objectionable.

THE MASS OF BEANS MUST BE MOIST, BUT NOT WET.

In order to ascertain if it were essential that the sweatings should run away, I had some beans enclosed in a 1 ft. cubical box, made perfectly water-tight, and placed in the midst of similar beans in the sweat box. Thus the correct temperatures were maintained in the water-tight box. When they were taken out at the end of six and a half days, those in the water-tight box were still sodden, and the pulp was not so dark as that in the beans fermented under ordinary conditions. On roasting, the resultant cacao was good in both cases, and almost equally so—that from the water-tight box was slightly more acid, and certainly a paler and brighter red. There was no development of that "hammy" flavour that is thought to be caused by leaving the beans soaking in their own juice. This experiment shows that the draining off of the sweatings is not of great importance under conditions of perfect cleanliness, and where the temperature is maintained. Under ordinary conditions, however, it is better to let the sweatings run away, as their presence lowers the temperature of the mass, and is apt to make the cacao sour.

IN THE LATER STAGES THERE MUST BE SUFFICIENT AIR.

In the later stages the oxygen of the air is needed to complete the fermentation. Oxygen is also needed to produce the brown colour. I attempted to get *more even* and *thorough aeration* by inserting upright in the mass of beans a number of bamboo tubes, from which the nodes had been removed, and the sides perforated. Warm air rose up these tubes, showing that circulation was taking place.

The beans so produced appeared identical with those fermented under normal conditions. On roasting they presented no differences. I ascertained later that horizontal tubes had been tried by three planters, two of whom thought they had obtained better cacao thereby. One of these used square wooden tubes, and abandoned them because the natives were always breaking them.

As a result of these experiments and observations, I recommend that no special device be made for aeration, but that

TEMPERATURE OF BEANS.

Hours in box	With bamboo tubes (greater aeration) Degrees Cent.	Normal. Degrees Cent.
16	28	28
24	29	29½
40	35	36
48	35	37
Bamboos inserted here		
64	49	49
72	48	47
88	46	48
96	48	48
112	48	50
120	48	51
136	51	50
144	50	50
160	47	47

(The freer passage of air would cause a cooling. The above temperatures are so similar that it becomes evident that sufficient heat must have been produced by the extra oxidation to compensate for this cooling.)

the boxes be raised 6 in. above the cement floor, and so arranged that air can pass freely under them. At the same time the wind should not be able to blow directly on the bottom.

Air is not only a necessity for good fermentation, but the better circulation prevents the growth of mould.

THE BOXES MUST BE KEPT CLEAN.

This means that they will have to be periodically scraped, and should they at any time become mouldy, a lime wash is advisable.

APPENDIX B.

THE SWEAT-BOXES.

Iron nails are objectionable, because they stain the beans

black. The tannin compound in the beans combines with the iron (which has passed into solution as acetate in the sweatings) to form a compound similar to ink. Iron nails should be hammered in from the outside. Copper nails or wood pegs should be used, if available. The corrugated iron of the roof, if freely exposed, is very slowly corroded by the acid vapours from the sweat-boxes. The cement of the floor is slowly dissolved away by the acid sweatings—asphalt would wear better. Glazed earthenware channels (which are said to be used in Surinam) would be an advantage if anything is to be done with the sweatings.

Double Walls.—The object of this is to form an air-blanket between the beans and the outside air, and to allow of aeration all round; incidentally, it strengthens the building by removing the outward pressure on the side walls.

Size of Sweat-box.—I recommend a box 4 ft. × 4 ft., because with a mass of beans this size fermentation proceeds without encouragement. If a larger size is used, it not infrequently happens that one day's picking does not fill the box; consequently, the following day's picking is added to it, and perhaps even a third day's picking; so that with such a mixture it becomes impossible to obtain an even ferment. The planters appear to think that, if the beans are not covered, fermentation will not commence. The fermentation of large masses of beans cannot be prevented in this way.

(To be continued.)



Charging. The use of carts for this is unusual.

Tobacco Planting.

PART VI.

BEFORE continuing in the usual rut, it is interesting to note that the *London Times* in its Russian supplement dated April 27th tells us that the growing of tobacco has been introduced throughout the area starting from the Government of Tchernigov (about 25° lat.), right down to the very southern boundaries of Russia. In the northern portion of this area is produced the more common Russian tobacco known as "mokha" and in the Crimea and the Caucasus the finer Turkish brands, Samsun, Trapezun and others. These last are so good that they are used in the preparation of "Russian cigarettes" in the very home of tobacco—the United States. The outlook for an increased output of Russian tobacco is specially favourable, as there is a tremendous area on the Black Sea shore from Novorossisk to the Turkish frontier south of Atum which is especially suitable for the purpose. At the present moment the best brands of tobacco are obtained from the environs of Suchum and Sochi in this district.

Regarding the increased demand for tobacco of a suitable character, Mr. H. C. Archer, of Messrs. R. and T. Hill, Limited, the well-known manufacturers, writing a review of the tobacco market for 1913 in the January issue of the *London Chamber of Commerce Journal*, tells us that the sudden and somewhat unexpected increase in the cost of Virginia and Carolina leaf of light colour, suitable for cigarettes, referred to in the report for 1912, was not only fully maintained as regards the 1913 crop of these growths, but actually showed further considerable advances; this, too, in spite of a very large crop (encouraged by the high prices realized in 1912) having been planted and harvested. It becomes more evident year by year that the present enormous and still increasing world's demand for tobacco of colour and quality suitable for cigarettes cannot be any longer met adequately by the American States, from which this class of leaf has up to now been more or less exclusively obtained, and that if the consumption of cigarettes continues in its present proportions—and the probability is that it will still further increase rather than diminish—it will be necessary for English manufacturers to look to other parts of the world to make up the deficiency. Rhodesia and Nyasaland, both British possessions, have proved that they are capable of producing tobacco which will compete most favourably with the United States article. Rhodesia grows leaf very similar, and in some respects even superior, to the light cigarette specialities of Carolina, with which it blends most admirably; while Nyasaland gives us a somewhat heavier bodied and richer tobacco, more after the style of that grown in the best districts of the "Old Belt" of Virginia. Up to the present time the tobacco produced in Rhodesia has only been sufficient to meet local requirements, and owing to the fact that, while a heavy protective duty is levied on all imported leaf coming into South Africa, the home-grown article is free, prices realized by growers have been highly remunerative and satisfactory. This condition of affairs has stimulated production to such an extent that last year, for the first time, the yield of Rhodesian tobacco was considerably in excess of home requirements, and this will necessitate seeking outside markets for the disposal of the surplus. Owing to the

exceedingly high prices now being realized for Virginia leaf, representing an advance of from fully 5d. to 6d. per lb. on the market quotations of two years ago, this Rhodesian tobacco, when of suitable colour and quality, should find a ready sale in the English market. The production of tobacco, both in Rhodesia and Nyasaland, may be said to be still more or less in its infancy, and in many instances there is room for improvement as regards the important matters of curing, handling and packing, but with more experience no doubt these difficulties will be overcome, and there is every probability of a large and important trade being forthcoming with this country in the near future. The experiments in growing tobacco on a commercial scale in the United Kingdom were continued and extended last year, the Customs report showing that the following growers' licences were issued: England 6, Scotland 1, Ireland 58. The industry is still quite in the experimental stage, but from the results up to the present it is evident that in order to obtain any fair measure of success, growers will be well advised to confine their attention to the cultivation of the heavier and darker varieties, suitable for the manufacture of shag and roll. The climate, temperature and geographical position of these islands are not suitable for the production of aromatic tobaccos, such as are required in the manufacture of cigars or Turkish cigarettes, and for the same reason it cannot be expected that leaf of the flavour, delicacy and colour of Virginia, now so much in demand for cigarettes, can be grown here successfully. The recent war in the Balkan States has seriously affected, and for some time to come will no doubt continue to affect, the regular supplies of choice Macedonian leaf required for the production of the finest qualities of high-grade Turkish cigarettes. Suitable tobaccos of good colour, flavour and quality have, however, been coming forward from the Asiatic provinces of Turkey, and these, to some extent, have supplied the deficiency, but they lack the peculiar delicacy and distinctiveness of the Macedonian leaf, and can only be regarded as substitutes. Fair tobaccos, suitable for making the cheaper grades of cigarettes, have also reached this market from those parts of Russia bordering on the Black Sea, and have met with a ready sale at good prices when satisfactory.

According to the *Cuba Review*, again, the Secretary for Agriculture there said that the rains to a certain extent had been beneficial, but he does not look for a good crop in 1914 unless it should rain in January. Dry and cool weather would keep the young plants small. We have not heard since what rain has fallen in this district, but understand that in the West Indies generally the weather has been rather hotter with more drying winds than the planters cared for. Disappointment and discouragement, the same paper tells us, has followed all attempts to grow Cuba's famous tobacco elsewhere than in its own territory in the Vuelta Abajo district in Pinar del Rio Province. Even in other provinces of Cuba there has been no success. Several years ago the United States Government experts announced that they had discovered identical soil and climatic conditions in Texas as those in the Vuelta Abajo region, and the then Secretary of Agriculture Wilson confidently expected that he would be able to produce tobacco equally as good as that of Cuba. A United States Government expert obtained choice

Cuban tobacco seed here and took it to Texas, planted it and cured it. But the result was far from being that obtained in Cuba's Vuelta Abajo. Experiments were continued, but always with the same result. A good tobacco was grown, but there was no comparison with Cuba's famous weed.

A new series of experiments with the same object in view, to grow Cuba's fine tobacco from Cuban seed, in Dade County, Florida, are about to be tried, with what success remains to be seen.

Cuban tobacco as it exists to-day is not of one variety or type, but may be said to be a composite, heterogeneous in variety, type and origin. This fact has been conclusively demonstrated, and has been proved several times in a succession of experiments in plant and seed selection. It is composed of several varieties of six or eight distinct types. We say distinct varieties and types because they have been separated and after segregation have reproduced themselves true to the parent plant, each type from the first to the third generation. The variety and specific type are pronounced.

Last month, it will be remembered, we gave the Cuban exports of tobacco, cigars, &c., for the years 1912 and 1913 (see p. 64).

Costs of Estate-making, Theory and Practice.

THE report of the Klanang Produce Co., Ltd., of Selangor is worthy of attention since, even in these hard times, the company has paid $77\frac{1}{2}$ per cent. dividend for the year, making a total of no less than $497\frac{1}{2}$ per cent. paid over to the shareholders in nine years, or £132,178 profit on a capital of £31,625. This year's profits were obtained from 321,270 lb. rubber (1,472 acres), 802,500 coco-nuts (600 $\frac{1}{2}$ acres), and 985 piculs coffee. In face of the estimated costs per acre for estates—rubber, tea, coco-nuts, or what not—that confront us daily and almost hourly, it is interesting to note that this company owns 2,072 $\frac{1}{2}$ acres, which, with a capital of £31,625, means a cost of only £15 10s. per acre. This shows that Sir William Lever's estimate, in his forewords to our two editions of "Coco-nuts," is possible even with a company-owned concern and, therefore, it certainly should be so with an estate owned by an individual. When answering his critics in his foreword to the second edition of our book, Sir William Lever said: "The amount of capital required to become the possessor of a rich coco-nut estate is not excessive, and should not exceed £10 to £12 per acre, including every expense except the planter's own labour and interest on capital—the capital, of course, being needed to buy the land and erect the buildings, as well as to maintain the planter until his estate gives him some return." For an individual planter the cost, above the amount stated, need be but small if necessity compels, once the capital was his to start with.

As regards the Klanang cost per acre, this was, of course, obtained partly by savings out of profits; and using the amount placed to reserve, in this case some £33,000, for providing the increased capital needed. But in order to have the money "at reserve" the estate

must have made it, and so can the smaller estate-owner to a corresponding degree. Where so many go wrong is, by basing their current expenditure on "good years" (leaving out seasons of exceptional prosperity), and by living up to the hilt, having no surplus, therefore, to extend the cultivations and increase the value of the estate, or even to exist on during a season of low prices or bad crops.

Discussing the coco-nut side of Klanang, the illustration here shown was included in our book (see p. 48 of the second edition), with the same wording as now. The



HOW COCO-NUT TREES YIELD IN THE F.M.S.

Illustration of a tree from the Klanang Estate, Jagra, carrying 360 nuts at a time.

photograph was, of course, taken some years back, and it would be interesting to know the history of this particular tree since, and to ascertain if it had fruited itself out and either died or been removed, or whether it was still going "strong" as the picture shows it to be.

Last year the estate derived, according to the report, £5,318 from their coco-nuts, but spent £3,969 on the area covered by them owing to a wise expenditure on account of manuring, liming, and generally higher cultivation and improved drainage, the benefits of which will be reaped

later on, whilst, be it noted, in spite of the heavy cost, a profit of nearly 50 per cent. was obtained during the crop under notice. As the coco-nut expert estimates, as a moderate amount, a profit of £8 per acre for healthy palms on good lands in the Peninsula generally, Klanang certainly should obtain same and, although owned by a company, it will perhaps be able to come up to Sir William Lever's estimate for an individually owned estate of £10 per acre profit, and £10, or even £8 an acre, on a capital cost of £15 10s. means a profit that should be enough for anyone. Our readers must, however, remember such returns are obtained only by experience, knowledge, care, attention, and by the saving of part of the profits during the fat years; last, but by no means least, by also watching the trees,* for, as the *Madras Mail* pointed out (and we quote on p. 602 of our coco-nut book), "The planter who neglects his coco-nut palms for a few weeks in the monsoon, and lets them get covered with weeds, as at times coffee, tea and rubber trees are covered, will find that the few that remain alive are scarcely worth troubling about. It is admitted, however, that if the coco-nut planter is able to have a look at each plant almost every day of the week, as does his Indian *confrère*, we believe it is quite likely that he will obtain the best results."

Tea Notes.

PROBABLY the chief item of interest to those in the Tropics concerning the 1914 Budget, which we criticize on page 91, is the fact that the "Breakfast Table" and the "Lollypop-shop" remain unaffected. If the Chancellor has not seen fit to safeguard our future supplies of foodstuffs and raw materials by giving a million for two agricultural colleges, he has not increased (nor diminished) the duties on tea, cacao, sugar, &c. At the same time the folly of not voting £500,000 (less than $\frac{1}{4}$ per cent. of the total taxation for the year) to establish a college for Ceylon and the East, shows an ignorant and short-sighted policy in regard to the future that is quite inexplicable to us. The supplies have always come in so easily that, beyond taxing it, the public through its Chancellor of the Exchequer, evidently imagine they will continue to flow in for ever, and are unable to

realize the money and knowledge required to produce the crops.

Turning to a pleasanter subject, there will be a big muster of tax-payers at the Hotel Cecil (Grand Hall) on Tuesday, May 26th, on the occasion of the Annual Assam Dinner for those who are or have been connected with the Province of Assam or other tea districts of India. Tickets are 25s. each, and the chair will be taken at 7.30 sharp by Mr. C. C. McLeod, Ex-Chairman of the Indian Tea Association. Mr. W. H. Pease, 21, Mincing Lane, is Hon. Secretary.

Mentioning Mr. Pease's name reminds us that Mr. Skinner, who succeeded the late Sir James Buckingham as Secretary to the India Tea Association has, we regret to say, also joined the majority, for we heard just too late to publish the fact last month that he died about the middle of April.

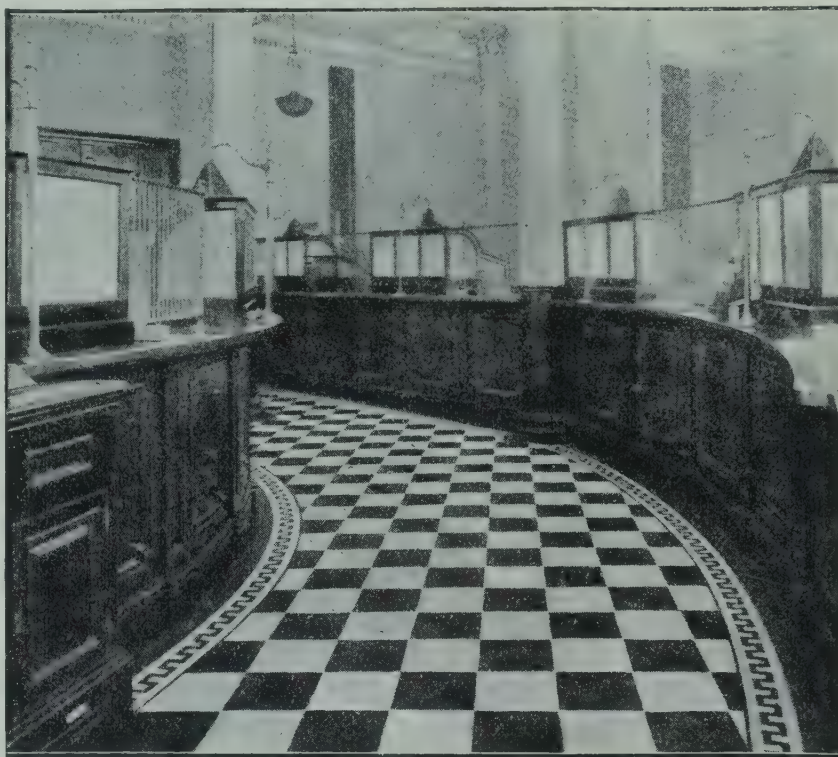
Kindly and courteous in the extreme, all those who had the pleasure of meeting him either in India in the old days, or latterly at the Association's room, will mark his absence from our midst with genuine sorrow.

Meanwhile the world hurries on. *Le roi est mort, vive le roi*, and now Mr. Pease reigns in place of Sir James Buckingham and Mr. Skinner. Still under 40, active and vigorous, long may he be spared to help the tea planting world of India, and they in return to have him as their Secretary. We believe that with his lengthy experience of the work Mr. Pease is the right man in the right place.

As to future supplies of tea, till the end of June the outlook offers

no encouragement to expect a surplus, says the *Indian Planters' Gazette*. Indeed, it is possible that demands may have to be made good out of stock. Shipments from Northern India for the season up to the end of February were about 8,000,000 lb. greater than they were a year ago, but as compared with the same period Ceylon tea supplies were about 5,000,000 lb. short, China 2,000,000 lb. short and Java tea 3,000,000 lb. short, so that on balance there is a deficiency of about 2,000,000 lb. in sight. Against this may be put the stimulating influence of high prices. Somehow when the market is strong there is wonderful activity among producers. The general opinion in well-informed planting circles is that coarse plucking will be freely resorted to during the coming season. Indeed, it is not at all unlikely that in both Ceylon and Java during the next few months quantity rather than quality will be the object aimed at.

Where Rubber is Used. No. 2.



No. 2.—Interior of the London Branch of the Bank of Australasia, showing the floor covered with rubber tiling made by The North British Rubber Co., Ltd., Edinburgh.

[Month by month we propose to include a photograph similar to the above, illustrative of the more modern uses of rubber, especially on a large scale.]

* This is also applicable to cacao cultivation, and is why small individual owners in an island like Grenada get such large annual yields per tree.

Discussing the statistical position, Messrs. McMeekin and Co. tell us that consumption and exports have, owing to the increase in each, begun at an earlier date than last year to reduce the volume of stocks. There is not at the present moment any evidence that relief for the distributor is at hand, but if India during 1914 shows a progressive increase such as it did in 1913, and Ceylon and Java resume their interrupted development, the position may not be so strong by the end of the year. Fair quantities are now being produced and sold from the large tea extensions undertaken a few years back in the low country of Ceylon, and it is reasonable to expect that supplies may later in the year be more in proportion to the demand.

For some reasons cheaper tea is much to be desired (again quoting *Indian Planters' Gazette*). There can be no doubt that the trade generally would prefer to use British grown tea in their blends, from the patriotic point of view as well as from the view-point of experience that it pleases the customers best. For quite a year now the margin of profit to the distributor has been diminishing, because as common tea has advanced in price it has become more and more in demand. Every effort to induce the tea-drinking public to desire something better than common grades seems to meet with very limited success as long as there is the inquiry, "Why pay more?" before their eyes. No doubt there is more refreshment and invigoration in a cup of really fine tea, but while the cost of living is still going up and the specialists keep landing their low-priced lines the easily persuaded public seem satisfied with common tea, and it is to be feared will continue to be satisfied as long as they get a strong, rough, colouring cup of tea for breakfast.

Independently of the state of the market there is a very decided opinion obtaining amongst planters in this district that the teas on the whole manufactured in South Sylhet have improved in flavour during the last ten years.

Curiously enough this is accounted for by the intensive cultivation and manuring that has come into vogue during the last decade. It is not so very many years ago when manuring in any form, when resorted to was looked upon as a necessary evil. When the operation was performed it was in order to increase the output, and no one imagined for a single moment that it would do otherwise than coarsen the tea and reduce the flavour. As a matter of fact so it did, but the manure was really not to blame for this. It was wrongly applied, and too much nitrogenous substance was added to the soil at one time without the necessary cultivation in order to allow of the roots assimilating a proportionate supply of mineral matters, and thereby insuring a well-balanced supply of all the constituents required by the plant. These things are being better understood now, but they were equally as well understood thirty years ago, but those who did understand were laughed at and called faddists. So they are, still, by certain sections of planters.

Messrs. W. J. and Hy. Thompson report that, speaking generally, the tone of the market was active and firm. Useful Assam and Dooars leaf teas between 9d. and 10d. per lb. met with keen competition. The average for the whole sale of Indian teas on garden account was 9½d. per lb., compared with 8½d. per lb. a year ago. Ceylons realized 9½d. against 9¼d. in 1913.

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART VI.

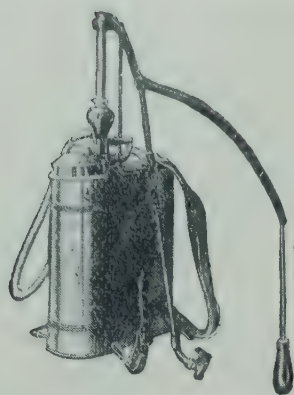
The Outfits of the Deming Co., of Salem, O., U.S.A.

IN the Tropics the production of economic crops on orchard methods has become one of the most profitable industries existent. It is said that where the factory and the field come into active rivalry in Europe, or even in America, the factory comes up top, so that agricultural industries are being more and more chased from the neighbourhood of the factory to the Tropics, with its warmth and fertility, but its scarcity of labour, in marked contrast to the overcrowded surroundings of the city factory. Just as the crowded and ever-increasing cities breed and spread diseases far and wide—with a decimating effect on the people within their radius, unless checked at the start—so in the same way, and for the same reasons, plantation crops in the Tropics, as everyone has seen, and many learned by experience, to their cost, also generate and spread diseases with a rapidity that would have been incredible had not the facts of these uncanny visitations been so well known to every tropical planter, whilst the comparative scarcity and the increasing cost of labour in the Tropics, necessary to prevent trouble or exterminate it when it appears, forces the planter to adopt the most up-to-date labour-saving appliances for his weapons of defence.

The same, therefore, as the first step to ensure success in the city is to place a capable man in charge of the medical sanitary department and to supply him with the necessary medicines and drugs, so on the tropical estate, without the district plant doctor, the spray machine and the medicine (Bordeaux mixture, Paris green, &c.), trouble will soon appear and run riot, and once it does that, woe betide the planter. It is not even sufficient to spray when the trouble is there; what must be done is to spray *before* the trees become affected by diseases known to be elsewhere in the neighbourhood.

Knowing this, the Deming Company of Salem, Ohio, have always paid careful attention to perfecting and placing on the market the most lasting, efficient and economical spraying apparatus yet invented—economical, that is, as regards cost in comparison to a high standard of quality, and economical also in the distribution of the fluid when at work. It is not difficult to imagine what a heavy increase in the expenses must be incurred over a large area were ever so little extra fluid given to each plant or tree. To-day, however, thanks to the bulletins and pamphlets issued by the various experimental stations, agricultural departments, &c., both English and foreign—pamphlets that would sell at shillings each were they issued by a publisher—everything that is worth knowing about pests, their causes and economical extermination, is fully dealt with, and can, as a rule, be learnt by writing a letter to the head of the department, and sending a stamp or two to cover the postage.

Leaving others, therefore, to play the doctor, the Deming Company have striven to place, and claim to have placed, first-class sprayers on the market at a reasonable cost, and their "Success" Knapsack Sprayer has become one of the most popular in use.



The "Success" Knapsack Sprayer (fig. 659).

This machine is specially adapted for spraying tea and cotton bushes and the lower portions of cacao and other trees. The cylinder, plunger, valves and tanks are made of brass.



The "Aerospra" Sprayer (fig. 663).

Their "Aerospra" is a compressed-air sprayer of improved design, with several new and valuable devices. With such a machine the operator, having pumped up, can spray at will until the reduced pressure after a time requires pumping up again.



The "Perfect Success" Apparatus fitted to a Bucket (fig. 689).

This, their "Perfect Success" Sprayer, shows how an adjustable foot-rest is combined with a bucket clamp. By means of this device the pump and bucket are rigidly fastened together, so that the whole outfit can be carried from place to place by the handle as desired.



The "Gardener's" Spraying Apparatus (fig. 651).

Apparatus No. 651 offers a larger receptacle for the fluid than a bucket, the same as the barrel in the next illustration is larger than this. The F. 651 machine has, in many cases, proved one of the most convenient outfits for general use, both for trees and bushes, especially when fighting San José scale; whilst

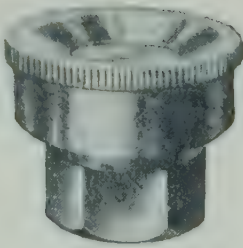


The "Century" Barrel Spraying Apparatus attached to Barrel (fig. 645).

the "Century" Barrel Sprayer is a "terror" to beat when, mounted on a trolley, it is used to treat either bushes or plants up to a man's height or trees several times as high.

For "big jobs" their spray pump, as illustrated on our advertisement p. xxxix, can do useful service when attached to a barrel or tank; whilst their double-action spray pump, or their plunger pump, worked by any gasoline engine, can eject powerful and widespreading sprays. Want of space prevents us from saying more, or of describing how movable platforms can be used to help when die-back in cacao, bud-rot in coco-nuts, or other trouble arises necessitating the top or crown of the trees being treated thoroughly and with care.

Needless to say, the Deming Nozzles leave nothing to be desired; made with great care, and turned accurately so as to fit exactly, their efficiency is well known on all sides. The nozzle—the "business end"



The Deming Simplex Nozzle (fig. 766).

of the whole outfit, illustrated here—shows their No. 766 Simplex make, others being the Bordeaux (965), Vermorel and Demorel (963 and 753 respectively), Spramist (768), Eureka (754), Acme (960), &c. Those wanting full particulars of sprayers, pumps, nozzles, tanks, or complete outfits should write to the Deming Company at Salem, Ohio, U.S.A., for a copy of their catalogue and price list.

Economic Zoology.

Our Motto, "Utilization not Extermination."

AFRICAN EXPLORATION.

NEW ANIMALS FOUND BY "OUR FRIEND"

DR. CUTHBERT CHRISTY.

A LETTER from Avakubi, Belgian Congo, the (London) *Daily Telegraph* tells us, states that Dr. Cuthbert Christy, the well-known explorer and scientist, formerly associated with the Liverpool School of Tropical Medicine, author of "The African Rubber Industry,"* and noted for his researches into the causes and spread of sleeping sickness, arrived at that place at the beginning of March, after a year's exploration of the big forest west of Mbeni and the Ruwenzori Mountains. He and his party have collected a great deal of interesting material, and some altogether new animals, besides many details regarding the natural history of the okapi. Dr. Christy has shot no fewer than four specimens of these animals, this being the first time that the okapi has been shot, or even seen, in its native haunts by a white man. He was enabled to do this by reason of the help which he received from the Bambuti pigmy trackers.

Dr. Christy, it will be remembered, was appointed by the Belgian Government to explore the Belgian Congo, to secure additions to the Musée du Congo Belge at Tervueren, near Brussels, and reached the Congo first in February, 1912. He has been assiduously at work ever since, in spite of the fact that he has been practically on the Equator all the time, and already he has achieved remarkable results which are practically unique in the history of Equatorial African natural history.

The shooting of the okapi, and the fact that Dr. Christy has been able to observe this animal in its native haunts, is easily a record. It was known that there were some of the species still existing in the neighbourhood of the Semliki and the Ituri, but no white man before had got near enough to observe them. This is the animal, as large almost as a horse, which was at first considered in England to be a species of zebra, as only the striped legs reached Great Britain, and it was only when specimens, which had been killed by native trackers, were sent to the Natural History Museum at Kensington,

that it was realized that the okapi belonged to the same order of ruminants as the giraffe.

One Belgian officer, the letter states, has already left on his way to Europe with one of the shot okapi, and Dr. Christy himself has sent several entirely new fishes which he has found to the Natural History Museum at Kensington for Dr. George A. Boulenger to classify. These were found in the streams and lakes around Mbeni, and are quite new to science, and Dr. Boulenger, the greatest authority on the fishes of Africa, will most probably regard them as a very interesting addition to our knowledge of the Dark Continent.

Dr. Christy will be remembered as being an assistant to Haffkine, in the Bombay plague laboratory, and the member of the first Sleeping Sickness Commission sent to Uganda twelve years ago, who returned to Europe by the suggested route of the Cape to Cairo Railway, through Gondokoro and Khartoum. He was sent out a year later to the Congo by King Leopold himself as a member of the Liverpool School Expedition, and has always been regarded here as the best investigator of Equatorial African conditions yet known.

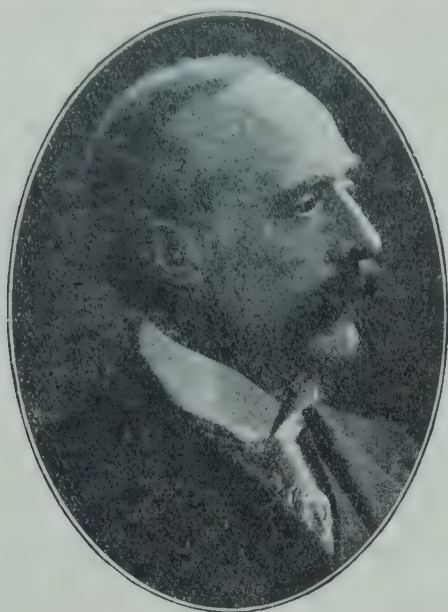
He and his party are in good spirits and health, and have strong hopes of making more important discoveries on their next long journey, which, if they carry out their original intention, will involve their travelling by water and land a distance of nearly 2,000 miles, between longitude 28 and 17 east and latitudes 1 and 5 north.

WE are not alone in urging our readers to increase the world's output of food-stuffs, especially meat, for we see Mr. Kryshstofovitch, in the article he contributes on Russian agriculture in the Russian supplement of the *Times* of April 27th, tells us that whilst England and Western Europe have accumulated a tremendous amount of experience regarding agriculture and its organization generally, in the markets of the world the prices of agricultural products are not only extremely high, but are rising daily, and that there exists to-day a famine in meat, lumber and cotton; this, too, in spite of all the improvements introduced and the excellent arrangements made for the preservation and transport of agricultural products.

Cattle-raising, forestation and an increased output of cotton, all main planks in our policy of economic politics, must therefore receive far more liberal support in areas under the British flag if we are to continue to hold our own. There is far too much tendency on the part of the few millions who dwell in towns and cities, including those who govern us and control our destinies, to imagine that because all goes well with them, thanks to their artificial mode of life, that all is right outside with the bulk of humanity, who not only keep themselves by the produce of the soil, but also keep the official, the manufacturer and others in the cities; and yet, without agriculture the city man would soon cease to exist.

"REFERRING to the remarks on the opening page of your April issue," writes Mr. Szurau the manager of the London House of Mr. R. Dolberg, the Portable Railway Engineers, "we also are receiving several inquiries from remote districts as a result of our advertisement in TROPICAL LIFE, and consider same a good medium."

* TROPICAL LIFE Publishing Department, 12s. 6d. net. or 13s. post free in United Kingdom, and 13s. 6d. abroad. Dr. Christy figured as "Our Friend" in TROPICAL LIFE for August, 1911.



"Tropical Life" Friend—No. 107.

MR. C. E. MUSGRAVE, F.C.I.S.

Secretary of the London Chamber of Commerce.

As this Journal is now received by every British Chamber of Commerce outside the United Kingdom, and by many of the leading foreign ones as well, "Our Friend" this month will prove an interesting and important addition to our, now lengthy, gallery.

Since "Our Friend" was appointed Secretary (in succession to Mr. Kenric Murray, most genial of men, and still, we are glad to report, "going strong" and very keen, at the moment, on the progress of events in Mexico) times have moved at motor-car speed,* but the Chamber of Commerce, like the London it represents, can well claim to have kept pace even with these go-ahead times. Not only has it expanded and taken up more floor space within its older building, but with the Council and Mr. Musgrave at the end of its gimlet of progress, it has bored its way, and a good wide one too, right through into Cannon Street, immediately facing Cannon Street Station, well known to every reader of TROPICAL LIFE who has visited London, and not far from the offices of Mr. Chiappini, the trade representative for South Africa, or Sir Wm. Taylor and the Malay States Agency.

According to the last report of the Chamber just to hand, the total membership is now well over 5,000, and includes leading men in both of our Houses of Parliament, and in legal, financial and literary circles, as well as in the mercantile and shipping world. Not satisfied with this, however, both "Our Friend" and Mr. C. E. Town, the Assistant Secretary, are working hard to make the membership exceed 6,000 before the end of the year, and it will not be their fault if they do not succeed. Meanwhile the total army of members

controlled by the Chamber can be said to exceed 45,000, as there are some three dozen or more Trade and Mercantile Associations (including the India Tea Association, London Cotton Brokers' Association, United Planters' Association of South India, &c.) affiliated to the head institution, and if these are included, as they could well be if questions of importance arise affecting the "rights of the citizens," then the total supporting or protesting power would, as stated, total up some 45,000 votes in all at the disposal of the Council of the London Chamber, of which "Our Friend" is the Secretary.

The work of the Chamber has been divided up and distributed among many committees and sub-committees, sections and sub-sections, of which the following will more specially interest the bulk of our readers:—

Section	Chairman
Australasian	Mr. E. B. Tredwen
Canadian	Mr. J. G. Colmer, C.M.G.
West African	Sir Owen Philipps
East African	Mr. Laurence Philipps
Tobacco Trade	Mr. H. C. Archer
East India	Mr. C. C. McLeod
Far Eastern	Mr. Frederick Anderson
Mexican	Lord Farrer
South African	Mr. William Soper
Silk Trade	Mr. Frank Warner
Joint West African	Section of London, Manchester, and Liverpool.

Meanwhile, there is probably no department which renders more direct and valuable services to members than the *Statistical and Information Department*, the work of which is largely developing every year and is becoming more and more appreciated by an ever-growing number of firms and individuals comprised in the Chamber's membership.

Having given details of this stronghold of the trade and commerce of London, of which the President (Lord Southwark, who sat in the House of Commons as Mr. R. Causton, M.P. for West Southwark) and the Council can be described as the lock, and Mr. Musgrave the key, we will conclude with a few personal remarks of the key itself.

Born in 1861, although he does not look it, he started his money-making career as a journalist, and after four years' experience as sub-editor and in other capacities, he joined the London Chamber of Commerce in 1882, became Assistant Secretary in 1884, and full Secretary in 1909. To-day he also, as a "busman's holiday" we suppose, acts as Secretary of the British Imperial Council of Commerce (an Association of all the Chambers of Commerce in the British Empire) as well as of the Timber Trade Federation of the United Kingdom, and of the London Labour Conciliation and Arbitration Board, and in 1912 was Secretary to the eighth Congress of the Chambers of Commerce of the Empire, which that year was held in London. He is, needless to say, a Freeman of the City, also a Liveryman of the Turners' Company, as well as a member of the Council of the Chartered Institute of Secretaries.

A frequent contributor to the press, Mr. Musgrave, who belongs to the Authors' Club, is responsible for a work dealing with the London Chamber of Commerce from 1881-1914, and is joint author of a book on the Factory and Workshop Act of 1901.

* We use this phrase as typical of the age, and because we read the other day that when commenting on the proposal to build a new and a larger dam across the Nile, and "scrap" the present magnificent Assuan Dam, the leading engineer or contractor is stated to have protested against the "modern hustler" and tendency to "scrap" everything in a year or two as being already out of date. This tendency, he said, was on a par with the present mania for rapid transport. When the first dam was being constructed we got along very well on the backs of donkeys, but to-day every man who is anyone must rush about in motor-cars, if not in aeroplanes, and insists on discarding everything else as being too slow and out of date.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 88-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

MAY, 1914.

A Spendthrift's Budget.

NOTHING TO FURTHER THE DEVELOPMENT OF THE NATION'S RESOURCES.

"Lay not up for yourself treasure on earth, where . . . thieves do break through and steal." The present English (or rather Welsh) Chancellor of the Exchequer is apparently striving to rid the earth of thieves by the simple process of starving them out, for who but the very rich (who in comparison will now go on getting richer) can afford to lay up treasure when we have to pay £210,000,000 in Imperial taxes, besides the heavy rates and payments due to local authorities, in these piping times of peace. One cannot help wondering what will happen when the present wave of prosperity passes, or if war should break out between this country and another nation what increased burdens will be imposed upon us. We say this for, as we pointed out last year,* when times are prosperous, especially when they are overflowing with prosperity, as we take it they must be for Imperial taxation alone to wring over £400,000,000 out of us in twenty-four months, then the well-managed Government, like the well-managed rubber estate (as the Klanang, for instance, see p. 85), lays aside a reserve fund—or, to be more correct, the Government *should* lay aside a reserve fund to further develop the resources it controls, and so enable them to stand not only the strain put upon them at the moment, but also to spread out and extend, thereby strengthening the basis of taxation for further strains on our resources in the

future, especially if trouble overtakes us in the shape of a series of bad years, and a war on the top of that. Troubles never come singly, and a nation thinks twice before attacking another that is "going strong"; therefore he who runs short of cash not only has less money to spend but often gets put to greater expense because his neighbour wishes to further weaken him and so render him a less formidable rival before the next cycle of prosperity comes round.

As this is, and always has been, the way of the world, and since to-day the Tropics are the main source of supply for the nation's food and raw material produced "under the flag," except perhaps wheat, it should have been the first thought of the Government to have put by the half per cent. on the total taxation, that we asked for last year, and so secure £1,000,000 with which to found two agricultural colleges in the Tropics, one in the East, possibly Ceylon, and one in the West, as Trinidad, W.I. But nothing of the sort has been done. As we have before pointed out, millions are spent on keeping us well, on fleecing us of our money, of ensuring that we shall eat indifferent cows' milk butter, instead of wholesome, nourishing coco-nut butter at half the price, but not one penny has been put by to assure a continuation of our supplies of food and raw material; in a word, so long as on paper the Government can show how many of the public have been attended at the public's expense, by the doctor, &c., nothing is done to teach us how to raise our food supplies when we are well. It is a mistaken policy, as bad as that which prevailed in France before the Revolution, only then it was the aristocrats who were at fault, and now it is the democrats. The present bubble of prosperity cannot continue without help; that help is not forthcoming even to the extent of a ½ per cent. on the total expenditure to develop the resources of the Tropics along the best lines, although they are the mainstay of the nation's larder and factory supplies. Truly this is another case of "Après moi—le déluge"—"Après le Welsh rarebit—dry bread and a bone." We hope those who have to gnaw the bone will learn before they starve that tea, sugar, coffee, coco-nut butter, tobacco, cotton, cocoa, and the thousand and one things that support life to-day, is worth a single million, once paid for all time, when a nation can throw about over £200,000,000 in twelve months everywhere but in the Tropics, as this country did last year, and proposes to do again.

"The Necessity of Establishing a British Tropical Agricultural College in the Western Hemisphere."

THE following is the synopsis of the paper that the Editor of TROPICAL LIFE hopes to read before the coming Congress of the International Association of Tropical Agronomists, to be held at the Imperial Institute next month (see p. 81). In view of the above remarks on the 1914 Budget, and the absence of any provision in it for the colleges we ask for, although their establishment is of the utmost importance from an International as well as an Imperial point of view, our readers would do well to note how the absence of the colleges tends to check not only our

* May, 1913, p. 91. "The Budget and the Tropics: A £195,000,000 Budget, but not a Cent for Tropical Medicine and Education."

interests in Latin-America, but also the well-being of the Continent of Africa, and our Indian Empire as well. In the course of this paper our Editor states:—

“I am not urging the claims of the West Indies as a competitor with Ceylon, but because I am certain that, if this country means to enjoy that share, to which it is entitled, of the ever-increasing commerce of Latin-America, we must have two colleges, one in the East, say in Ceylon, and one in the West, say in Trinidad.

“Our esteemed President, Professor Dunstan, estimated that £500,000 would be needed to place the Ceylon College on a secure basis. If it is so in the East it certainly would be so out West, and this means that someone has to put down a million sterling to establish two colleges. Those who do so will get better value for their money than even the shareholders receive in any three of the best paying rubber estates, although they have already got back their capital several times over. There is, of course, only one source from which such a sum can come, namely, the general public, who will benefit by the establishment of the two colleges in every possible way, both as regards the assurance of increased supplies of raw materials for their factories, as well as the large shipments of food-stuffs which we now draw weekly and daily from the Tropics, and without which the bulk of the population in this country and the world generally would find it difficult, if not impossible, to exist for more than a few months. The importance, therefore, of scientifically training tropical agricultural experts and planters is not confined to any one country, but is quite international in character, and before going on to discuss the class of student that I am hoping to see make use of these colleges, I would like to call your attention to the fact that, according to *The South American Journal*, we have £1,001,756,565 sterling invested in Latin-America.

“A strong point also in favour of a second college to be established in the West Indies is the fact that experts and planters going to West Africa could well be trained there, since many men who have been trained in the West Indies, and especially in Trinidad, are doing well in West Africa, which, with Equatorial Africa generally is one of the most, if not actually *the most* important tropical centre affecting British interests in the world, and as it would be impossible to properly train whites in Equatorial Africa they must come down to a Trinidad college as being the centre most accessible and surrounded by the class of labour and conditions generally most closely resembling those that prevail in West and Equatorial Africa.

“I attach this importance to tropical Africa because we are told that South Africa is getting drier every year, and that this has generally been ascribed to the destruction of trees; and as the Royal Commission on Indian Finance tells us that the monsoon, to which India owes so much, and on which the food of millions is dependent, is derived from the heart of Africa,* not only is it necessary to make the question of the deforestation of Africa a national one, but even an international one, as otherwise famine and death will come sooner or later to Africa and India alike, and

since we cannot train our experts in Africa, I maintain that Trinidad or elsewhere in the Western Hemisphere offers the most suitable site for an agricultural college for Englishmen going to Africa, the West Indies, and Latin-America generally.”†

Plumage v. Putumayo.

WHICH SHALL PREVAIL, “THE FANATICS OR THE FURIES?”

“THE Upper Reaches of the Amazon,” by James Froude Woodroffe (Methuen and Co., Ltd., 36, Essex Street, Strand, W.C., price 10s. 6d. net; weight 29 oz.), to which we referred in the concluding words of Mr. Woodroffe’s sketch, on p. 70 in the April issue, has now come to hand, but we must wait for more space in our June issue to do it justice. Severely edited, in the same way as Hardenburg’s “Putumayo,” the most telling episodes have been deleted; why this should be necessary we fail to understand, for through such a course the public never know the real truth of the disgusting deeds and debased lives that men, through the absence of “public opinion” (call it Mrs. Grundy, most stupid, but most useful of beings, like the Puritans were in the past), are wont to live in these inaccessible regions in Latin-America. What is worse still, they will continue to live it until the whole truth is made known to the thinking public so that it can wake up and put a stop to it once and for all time. There was nothing, except the horrible impressions, left behind, in either Hardenburg’s or Woodroffe’s manuscript that could not have been published as a medical work and thought nothing of; it would even be valuable to show what tortures modern mankind can endure without dying; why not, therefore, let them be put in print, for the low-minded can be kept out of the way whilst the high-minded man and woman would undoubtedly then rise up in disgust and give the whole matter its *quietus* by boycotting Latin-America as a continent, if by no other way; and until the *quietus* is given to these disgusting deeds, the industry will never prosper, at any rate whilst the East remains with its scientifically produced rival. Why Mr. Hobhouse, Lord Buxton, and Mr. Montague

† See *United Empire* (*Royal Colonial Institute Journal*) for April, p. 393. The thirtieth annual report of the Chamber of Commerce of the Orange Free State for 1913 also says: “The drought we have passed through, and are experiencing at the present time is, I believe, the worst on record. There is no question that the drought has raised serious problems, which must be studied, enquired into and solved, if agriculture is to be placed on a surer basis. Hand in hand with irrigation comes that much-discussed but little tackled question of the prevention of soil erosion” (see also our book on “Coco-nuts” re floods and harm to the country one season and excessive drought the next). “The farmer (in South Africa),” Mr. D. H. Ledward tells us in the May issue of *United Empire*, p. 393, has had to work out his own salvation without support or advice from the State, and consequently with nothing to guide him but his own and his neighbour’s experience. Very little was known about the working of the soil, the growth of crops and the breeding of stock. . . . The complications arising from disease, drought, extreme and rapid changes of temperature are legion. . . . In theory (p. 395) the majority of these subjects could be dealt with by local authority, but in practice it has been proved beyond doubt that governing bodies are far more likely to adopt, and consistently pursue, an enlightened policy when dealing with large areas and a diversity of interests.”

* In the same way as Sir Ernest Shackleton tells us the ice season in the Antarctic affects the rainfall of Chili and Argentina.

should be allowed to waste the time of the House of Commons and ruin an English trade with their Plumage Bill, based on a fanatical campaign and not on facts, and allow these horrors to continue, as they are doing, is a question that we cannot answer. Truly this is a day of freaks and furies. Ospreys, peacocks, pheasants, &c., may not be farmed and their feathers used as is the case with ostriches, because it is said to be cruel, but the most atrocious horrors can be perpetrated on helpless men, women, and children to get rubber, and no steps are taken to place the real facts before the public; nor is an international conference asked for to denounce those who use the rubber, as is proposed in the case of the birds. And yet with the latter the conference is unnecessary as the trade is more anxious than the fanatics to stop extermination or any chance of cruelty, whilst with the rubber once these facts were really known, surely the public who object to the bird trade will boycott Amazonas rubber, and so force the evils to be stopped for ever. It really looks as though the Government think more of birds, who do not need their protection, than of human beings who do. Meanwhile we hope Mr. Woodroffe's book will have a widespread circulation, for until these horrors are stopped, neither Brazil, Peru, or Bolivia can flourish, since their rubber exports enter so largely in their ability to trade, even in the bare necessities of life.

Coco-nuts.

MR. H. HAMEL SMITH and Mr. F. A. G. Pape have conjointly written a book in canonization of the coco-nut. It is a second edition with a foreword by Sir W. H. Lever, Bart., and has been published by John Bale, Sons and Danielsson, Ltd. Apart from the splendid certificate the writers of this book give the coco-nut by calling this industry "The Consols of the East," we have the testimony of the Assistant Botanist, Mandalay, who says: "It is a noticeable fact that even in countries which are naturally far less favourable for its cultivation than Burma, coco-nut planting, as a commercial undertaking, has always received the best of attention because it is a safe investment and a positive source of wealth." If a boom is really coming in coco-nut growing it is advisable for intending investors to read up such a book as this, which will give them full information of how to go about the development of an estate. The industry will be a healthy change from rubber planting, which has kept investors in a fever for years and has proved to be more a speculation than a sound industry. It is not quite safe to say what European dabbling in coco-nut growing will land the industry in, but it is safe to say that in the stodgy way it is now run by native planters it is a steady source of income. The estimate given for opening up a coco-nut plantation is £10 to £12 per acre, including every expense except the planter's own labour and interest on capital. It takes seven years for a plantation to begin yielding a crop, and thereafter a plantation of, say, 200 acres can be counted upon to yield a net income of £2,000 a year. As so much of the land in the Tropics is suitable for coco-nut growing it is surprising that more Europeans do not invest in estates when the profits are said to be so tempting and the income secure.—*The Indian Planters' Gazette*.

The Spineless Cactus as a Cover Crop and Fodder Plant.

So much has been said about the possibilities of the prickly pear as a cover-crop, mulch, and cattle feed were it not for the spines, that many of our readers will be interested in the following letter published by Mr. R. Farrell in *The Farmer's Weekly* of Bloemfontein, S. Africa:—

"In your issue of Nov. 19, some one wants to know where he can purchase a thousand leaves of the spineless cactus. The real 'Opuntia' or spineless cacti are not grown in any large quantities. I have for years advocated the growth and use of this most wonderful fodder plant after a visit to Kew Gardens (London) in 1904. The great Luther Burbank assured me there was not one of his Opuntias or spineless cacti in South Africa, although many claimed to have the real thing. Burbank sold his plants to an Australian early in 1905, say, the 'Santa Rosa,' 'Sonoma,' 'California,' 'Chico Tressus,' and two others for the sum of £1,000, with the sole right to the same for South Africa and Australia, but I have not heard anything of this firm since, except extracts from an occasional Australian newspaper.

"I have and still grow the Algerian variety. They are prolific bearers of very large leaves. I exhibited at the last Witwatersrand Show six leaves, 28 in. by 10½ in. that weighed 4½ lb. to 5 lb. each at only about nine months' growth, so that I quite believe what I have read of the spineless cactus producing 100 or more tons of fodder to the acre. In 1908, Mr. Lee, the then President of the Intercolonial Agricultural Union, was the first practical authority we had on the spineless cactus. He exhorted his farmer friends to try this wonderful plant, but his good words fell upon barren soil. I have a friend in the Orange River Colony, who some years ago planted a heap of spineless cactus, and now gathers tons of the most luscious fruit, good for all kinds of preserves, as well as feed for pigs and poultry, the leaves being fed to cattle as required. Undoubtedly, the spineless cactus is a most wonderful fodder and fruit plant. The following analysis may be of use to stock-raisers: Water 94.70, ash 0.96, protein 0.66, crude fibre 0.75, starch 2.88, fat 0.5."

Mr. B. Harrison, of Australia, writes also on the "Spineless Cactus" in the *Madras Mail*, as follows:—

"This remarkable plant is not yet much known, but it would prove invaluable to stock-owners, especially in poor or semi-arid soils, where vegetation of any kind will hardly exist. During the hot dry seasons or periods of drought, when all other fodder is languishing or destroyed with the intense heat, this plant would be luxuriant, and being of a rich juicy nature, it would also greatly minimize the necessity for much water, if any, and would therefore prove the salvation of many stock-owners. It can easily be grown in any kind of dry soil, and after the first year will produce about 100 tons per acre of succulent and nutritious fodder—which can be fed to all classes of stock and poultry, and it is highly recommended by the leading American authorities. Some of the improved varieties yield heavy crops of large and well flavoured fruit of various colours, which make excellent preserves, and the fleshy young leaves are a good and wholesome vegetable cooked in different ways, and they also make good pickles. No other plant yet known will give such an immense yield of both fruit and fodder even under the most adverse conditions, and stock-owners should give this important matter their best attention."

Kuala Lumpur honours Mr. L. C. Brown.



GROUP TAKEN OF THE HEAD OFFICE STAFF, DEPARTMENT OF AGRICULTURE, KUALA LUMPUR, F.M.S., ON THE OCCASION OF THE RETIREMENT OF MR. L. C. BROWN FROM THE POST OF INSPECTOR OF COCO-NUT PLANTATIONS.*

Back Row, standing :—(1) Jamail Singh, (2) Narain Singh, (3) Gadah Singh.

Second Row, standing :—(1) S. Uda, (2) S. Ponniah, (3) W. Cornelis, (4) Fung Yit Lai, (5) O. Ambak, (6) J. Yahaya, (7) D. Santhanathen, (8) M. Vallupillay, (9) V. A. Naidu, (10) S. Arumugam, (11) T. R. Naidu, (12) M. Fathiel, (13) M. Drus, (14) M. S. Doss, (15) S. T. Joseph, (16) S. Nagalingam, (17) Ameer Khan, (18) M. Noor, (19) D. Ratna Raja, (20) S. Saravanamuthu, (21) Hassim, (22) K. Govindasamy, (23) M. Sinnathurai.

Third Row, seated :—(1) T. C. Nock, (2) A. Sharples, (3) F. W. South, (4) H. C. Pratt, (5) L. C. Brown, (6) L. Lewton-Brain, (7) B. J. Eaton, (8) F. G. Spring, (9) J. Lambourne, (10) F. de la Mare Norris, (11) L. Francke.

Fourth Row, seated :—(1) Nadasan, (2) Sivaguru, (3) Santhiago, (4) John, (5) Ahamat, (6) Savarimuthu, (7) Katheravaloo.

* See TROPICAL LIFE, June, 1912, with Mr. L. C. Brown as "Our Friend."

A "Futurist" Cow.

MILK, BUTTER AND CHEESE FROM SOYA BEANS.

IT has yet to be seen whether or not, at any of the coming tropical agricultural congresses, we shall be told of the secrets buried away in the processes whereby pure and wholesome milk of highly nutritive value, possessing all the virtues, but none of the dangers, of the "real thing," can be manufactured synthetically from soya beans: a milk so real, according to an article in the *Times*, that excellent cheese and butter can be made from it. The fluid, we are told, "is something more than a food substance; it is a living fluid, containing a definite strain of bacteria which assist in its digestion. In order that the synthetic milk may approximate in all respects to the real milk, bacteria of the required strains, including the lactic acid (sour milk) bacilli rendered famous by Metchnikoff a few years ago, are introduced to the fluid, and permitted to act upon it until it reaches exactly that state of what may be termed maturity at which fresh cow's milk is obtained. That it is, indeed, a real milk is proved by the fact that excellent cheese and butter can be made from it." The idea of making such milk is nothing new. It originated with the Chinese, but the help of a German scientist was necessary to make it a perfect milk, and to remove the penetrating disagreeable taste of the fluid as prepared by the Chinese.

Meanwhile, what a vista of possibilities is opened up

before us; what independence of the rest of the world by the most remote and mountainous centre once the ground nut and the soya bean can be brought to yield freely in its midst. If the modern make of internal combustion engines may alter in time, as is claimed, "the entire geographical distribution of the industrial centres of the world, for in that case the nut plantation of the future will bear the same relation to the factory that the coal mine does now,"* so it may come to pass that many classes of food, nutritious, pleasant, and offering considerable freedom from monotony, will be evolved from soya beans once they can be grown on the spot, or transported at no great cost from centres where the climatic and other conditions are conducive to big crops. Think, for instance, what the successful cultivation of soya beans up in the plateaux or cool heights of the Andes might mean to the estrada owner or seringuero of the Amazon valley, when the crop is brought down from the colder uplands by llama, mule, canoe or steamer, either as beans or oil, or else as meal, vermicelli, milk, butter, cheese, or what not, made from the beans. Nothing, it seems, need be wasted, as the oil is removed first. "The new milk," again quoting the *Times*, "has been built up from a basis of casein obtained from the soya bean. Casein, of course, is likewise the basal constituent of cow's milk. The beans are treated by a special process whereby *all oil* and waste matter are removed, and only

* See TROPICAL LIFE, p. 172, September, 1912, on "Vegetable Oil, the Oil of the Future for Motive Power in the Tropics."

the pure casein left. To this basis are added in exact proportions fatty acids, sugars and salts, and emulsification is carried out. The difficulty of producing a perfect emulsion (for milk is one of the most perfect emulsions known) has been completely overcome, the new fluid satisfying every test in this direction, even to the extent of refusing to 'cream.' Those who attended the last London (1911) Exhibition will remember that about that time there were rumours of utilizing soya oil jelly for making synthetic rubber, and the stall facing TROPICAL LIFE had a lump of this jelly-like substance in a glass jar, which we were told was similar to that used for experimenting with.

Meanwhile, although the uses to which soya-bean products can be put, already so numerous, seem likely to increase, and each one needs, or promises to need, substantial supplies of beans, the area under cultivation does not increase to anything like a corresponding degree; and, in fact, the oil-expressing industry is already languishing for want of supplies. The soya bean, the *Oil and Colour Trades' Journal* was telling its readers the other day, "shows no sign of regaining the importance which it held in the oil markets of 1910. Japan is sending us nothing now, and is probably capable of dealing herself with all her own supplies. The total receipts for the two months are only 17,500 tons against 32,000 tons in 1912, and 64,000 tons in 1911. It is regrettable to see the decline of this once very promising industry."*

The matter deserves attention, for even if all the uses that admirers of the bean claim for it have not yet proved possible on a commercial basis, and in the present ratio of production to consumption perhaps it is as well that they have not done so, from all we have been hearing for some months, it decidedly looks as if a huge demand is likely to spring up for soya beans in the near future, and that, too, quite outside the Asiatic requirements in China, Japan, Manchuria, &c. The bean will not yield satisfactorily in many centres; conditions closely approaching those prevalent in Manchuria seem, so far, to have produced the best results. There are many kinds of beans, but the light-coloured variety (as pointed out by us in April, 1913, p. 72) seems to give the highest percentage of oil, and to leave the most attractive coloured cake, so that if there is a better kind we should like to know of it. Other kinds, as we pointed out, are not to be recommended, and some are harmful, as the cake contains too much prussic acid. The whole question of increasing the oil content, also perhaps the casein content, and of generally improving the present kinds known, requires to be investigated, and experiments carried out similar to those undertaken with the sugar industry, cane and beet. If this were done, the output of oil, casein, or other desired product per acre could no doubt be increased.

Meanwhile, it is interesting to note that, according to the report of the Agricultural Department, Assam, Manchurian soybeans were tried on a small scale at Jorhat with great success, the yield being over 18 maunds per acre. Other crops tried at Jorhat were groundnuts and potatoes, the former produced a fair crop, but much of the produce was eaten by rats in the field; potatoes gave a poor yield.

Dry-farming in Ceylon.

IN an interesting paper presented by Mr. A. W. Bevan to the Agricultural Society, Ceylon, on "Dry-farming," that authority said:—

"The question will be asked: 'What is Dry-farming?' One of the first authorities on the subject says, 'Dry-farming may be defined as the conservation of soil-moisture during long periods of dry weather by means of tillage.' Dry-farming differs from ordinary farming in that the chief object of the dry-farmer is to prepare his land to receive and retain as much rain as possible.

"Regarding coco-nut planting, this, from my point, is of secondary importance to paddy cultivation, as the former is chiefly in the hands of the rich and intelligent members of the community who are well able to look after themselves. As is well known, there are certain areas within the dry zone on which coco-nuts suffer much from deficient rainfall. The Experiment Station at Mahailuppalama has demonstrated that with dry-farming it is possible to make coco-nuts bear in five to six years. Unfortunately, the place is not easy of access, and very few people have been able to see the results. What has been done at Mahailuppalama can be done elsewhere on coco-nut estates situated under similar climatic conditions. The old belief was that for the successful cultivation of coco-nuts a minimum rainfall of 50 in. per annum was essential. With dry-farming and the possibility of storing much of the rainfall in the soil, a rainfall of 30 to 40 in. will possibly suffice. In arid regions the soil is light and free. The general belief is that such soils are poorer than soils with more body. Chemical analyses may confirm this belief, but the root-system of trees growing in free soils is more extensive than in the case of stiffer soils. Most, if not all, coco-nut planters are aware that the roots of coco-nut trees growing on sandy soils go down to a great depth till they reach the region of permanent moisture. They will also have observed that coco-nut trees growing on sandy soils stand drought better than those growing on hard soils. This is because their roots reach the water plane. Where moisture penetrates, air follows. The oxygen of air helps to render soluble the vast stores of insoluble plant-food in the soil. Roots that travel deep into the soil find both water and food to nourish them. I noticed recently that coco-nut trees growing on the North-western coast until Chilaw is reached showed no signs of the drought then prevailing. I attribute this to the roots having gone deeper and deeper in search of moisture during the dry years that preceded 1912. They must now be drawing water from greater depths than before. A word now about the 'Wanni,' the 'Desert' of Ceylon. It has been the aim of several Government agents of the Northern Province to induce the congested population of Jaffna to settle down in the Wanni, but I do not think the Government offered sufficient inducement."

As stated at the beginning of this issue, we hope to contribute a paper to the Dry-farming Congress in America and to be able to discuss not only such a case as the one quoted above but also concerning other centres and crops about which it will be necessary to consult men from the spot who are coming over to attend one or other of the Congresses.

* See also TROPICAL LIFE for April, 1913, pp. 71-72.

Cotton.

THE following were the prices for Cotton in London on May 7th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1914.		Compare Good, 1913.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds *	5 $\frac{1}{4}$	to 5 $\frac{7}{16}$	5 $\frac{1}{2}$	to 5 $\frac{13}{16}$	5 $\frac{3}{4}$	to 6 $\frac{1}{8}$	—	5 $\frac{15}{16}$	to 6 $\frac{1}{8}$	5 $\frac{5}{8}$	to 5 $\frac{13}{16}$	—
Madras ...	5 $\frac{1}{16}$	to 5 $\frac{15}{16}$	4 $\frac{15}{16}$	to 6 $\frac{3}{16}$	—	—	—	5 $\frac{7}{16}$	to 6 $\frac{7}{16}$	5 $\frac{1}{4}$	to 6 $\frac{1}{16}$	—
Bengal ...	—	—	4 $\frac{5}{8}$	—	4 $\frac{7}{8}$	—	5	5 $\frac{7}{16}$	—	5 $\frac{1}{4}$	—	—
Assam ...	—	—	5 $\frac{3}{16}$	—	5 $\frac{9}{16}$	—	5 $\frac{13}{16}$	5 $\frac{5}{8}$	—	5 $\frac{5}{8}$	—	—
China ...	—	—	5 $\frac{3}{8}$	—	5 $\frac{11}{16}$	—	6	5 $\frac{7}{8}$	—	5 $\frac{7}{8}$	—	—
West Indian ...	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	7 $\frac{3}{4}$	—	7 $\frac{3}{4}$	—	—
Sea Island ...	11	—	14	—	17	—	20	15	—	14	—	—
West African ...	6 $\frac{3}{4}$	—	7	—	7 $\frac{7}{16}$	—	—	6 $\frac{3}{8}$	—	6 $\frac{1}{2}$	—	—
East „ ...	7 $\frac{1}{8}$	—	7 $\frac{15}{16}$	—	9 $\frac{1}{16}$	—	—	7 $\frac{7}{16}$	—	7 $\frac{3}{8}$	—	—

* Liverpool quotations.

The market has fluctuated on a very small scale during the week (ending May 9th), and the prices of American Futures show but little change; very near positions are about 2 $\frac{1}{2}$ points up, but distant are about 4 down. Spot quotation is reduced 8 points. East Indian has been very dull of sale, and prices on the spot are $\frac{1}{16}$ d. to $\frac{1}{8}$ d. per lb. lower. For arrival the demand has been extremely limited, and quotations show $\frac{1}{16}$ d. to $\frac{1}{8}$ d. decline.

The import into Liverpool this week amounts to 31,475 bales, since September 1st 3,906,398, same week last year 40,017, last year's total 4,033,083 bales. The estimated Sales amounted to 42,000 bales, including "called." Middling American is quoted at 7.27d. per lb., last year 6.66d., 1912, 6.49d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight ...	13,799,000	13,127,000	15,047,000	bales
Exports from United States since September 1st—				
To Great Britain ...	3,084,000	3,244,000	4,001,000	—
To Continent, &c. ...	4,562,000	4,067,000	5,237,000	—
Total crop ...	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	May 8th.	Same time 1913.	Same time 1912.	
May ...	6.92	6.42 $\frac{1}{2}$	6.28	per lb.
May—June ...	6.91 $\frac{1}{2}$	6.42	6.28	—
June—July ...	6.78 $\frac{1}{2}$	6.39 $\frac{1}{2}$	6.29 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and G. WOODHOUSE.

At the beginning of May, according to Messrs. Düiring and Zoon, the stocks in the principal ports of Europe show an increase of 91,000 bags against a decrease of 131,000 bags last year; the visible supplies show a decrease of 493,000 bags against a decrease of 585,000 bags in 1913. There have been slight fluctuations in the market for "futures," which close steady at a small advance for the week. We quote :—

	To-day	April 30th, 1914
London ... Santos, Sept. del. ...	42s. 6d.	42s. 3d.
New York ... No. 7, Rio „ ...	8.81 cents	8.73 cents
Hamburg ... Santos „ ...	48 pf.	47 $\frac{1}{4}$ pf.
Havre ... Santos „ ...	59 $\frac{1}{4}$ francs	58 $\frac{3}{4}$ francs

The receipts at Rio and Santos from July 1st, 1913, to May 6th, 1914, were 12,943,000 bags, against 10,721,000 bags and 11,761,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

Mysore.—60s. 6d. to 68s. 6d. for smalls, 66s. 6d. to 75s. 6d. for low middling to good middling, 71s. to 86s. for middling to fine bold.

Coorg.—58s. to 65s. 6d. for smalls, 65s. to 70s. 6d. for medium, 69s. to 76s. 6d. for bold.

Neilgherry, &c.—64s. to 65s. for smalls, 71s. to 74s. 6d. for middling, 76s. to 81s. 6d. for bold.

Naidoobatum.—75s. to 77s. 6d. for middling, 81s. 6d. to 82s. for bold.

Travancore.—59s. to 65s. 6d. for smalls, 69s. to 73s. for middling to good middling, 76s. to 77s. 6d. for bold.

Mocha.—At 83s. to 83s. 6d. for long berry greenish.

Nairobi.—At 67s. to 74s. for middling to good middling, 84s. for good bold.

Uganda.—At 57s. for fine ordinary, 74s. for bold.

Sumatra.—At 80s. for bold yellow Liberian.

Jamaica.—At 51s. 6d. for ordinary, 63s. 6d. for fine ordinary bold.

Costa Rica.—At 54s. 6d. to 72s. for ordinary to good smalls, 55s. 6d. to 67s. for ordinary to fine ordinary, 69s. 6d. to 82s. for fine fine ordinary to good middling, 76s. 6d. to 86s. 6d. for good middling to fine bold.

Guatemala.—At 60s. 6d. to 62s. for smalls, 68s. 6d. to 72s. 6d. for middling to good middling, 70s. 6d. to 77s. for bold, 109s. 6d. for Maragogipe.

Salvador.—At 62s. 6d. to 64s. for smalls, 64s. 6d. to 75s. for fine fine ordinary to good middling, 72s. to 82s. 6d. for good middling to good bold.

Vera Paz.—At 71s. 6d. to 81s. 6d. for middling to good middling, 73s. 6d. to 80s. for middling to good middling bold, 91s. to 106s. for fine to very fine bold, 103s. 6d. to 106s. 6d. for Maragogipe.

Mexican.—At 61s. to 61s. 6d. for smalls, 66s. to 74s. for low middling to good middling, 74s. to 81s. for bold.

Colombian, &c.—At 69s. 6d. for middling, 74s. to 74s. 6d. for bold.

Dumont Santos.—Unwashed at 52s. to 52s. 6d. for medium.

Coco-nut Products, &c.

THE end of April, report Messrs. Mordaunt Bros., found for sellers of coco-nut oil a troublesome absence of demand, which caused them to lower prices still further, though, apparently, without a corresponding amount of business resulting. During the first days of May the market remained idle, and by the 9th, although a further drop of 7s. 6d. a ton had taken place, the demand showed no improvement, prices on that date (May 9th) ruling as follows:—

<i>Palm oil (Liverpool):</i>	1914	1913	1912
Per cwt.			
Lagos ...	29s. 6d. to 29s. 9d.	30s. 6d. to 30s. 9d.	29s. to 29s. 6d.
Benin ...	28s. 3d. to 28s. 6d.	28s. 9d. to 29s.	28s. 6d.
Congo ...	25s. 3d. to 25s. 6d.	26s. to 26s. 3d.	27s.
Bleached ...	32s. to 33s.	33s. to 34s.	32s. 6d.
Clarified ...	29s. 3d. to 30s. 6d.	29s. to 30s.	29s. 6d.
<i>Palm kernel oil</i>	38s. 3d.	41s. to 43s. 3d.	36s. 3d. to 36s. 6d.
<i>Coco-nut oil:</i>			
Cochin ...	51s.	50s.	42s.
Ceylon ...	43s.	45s.	41s. 6d.
English pressed	38s. 3d.	40s. 9d.	35s. 9d. to 36s. 6d.
<i>Copra oil:</i>			
Ceylon ...	None	None	38s. to 39s.
Cochin ...	50s.	49s.	42s.

By May 16th a further decline of 6d. to 9d. per cwt. had to be registered, but this still failed to attract buyers, and the market remained idle at 42s. 6d. to 43s. for Cochin, and 38s. 9d. to 39s. 3d. for Ceylon c.i.f. Pressed Oil was lower and quoted at 37s. 6d., and Palm Kernel Oil met with only a limited demand at 37s. 6d. to 38s. f.o.b. Hamburg.

According to the *Public Ledger* prices on May 15th were:—

Soya Oil.—Hull. All positions, £26. Oriental (in cases) afloat, £25 c.i.f.; March-April, £25 10s. c.i.f.; April-May, £25 10s. c.i.f.; May-June, £25 10s. c.i.f.; June-July, £25 10s. c.i.f.; July-August, £25 10s. c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £42; April-May, £39 c.i.f.; May-June, £39 c.i.f.; Cochin spot, £51; April-May, £43 c.i.f.; August-October, £42 15s. c.i.f.

China Wood Oil.—London spot, £29; March-April, £26; April-May, £26 c.i.f.

Palm Oil.—Lagos on spot, £35.

Palm Kernel Oil.—Prompt, £38 2s. 6d.; May-June, £38; July-December, £37 10s. f.o.b. Hamburg.

Soya Oil Beans.—Parcels spot and afloat, £8; April-May, £8; May-June, £8 5s.; June-July, £8 7s. 6d.; July-August, £8 8s. 9d.; August-September, £8 10s. Hull.

Linseed Cakes.—London made, £7 10s. to £7 12s. 6d.

Cotton Cakes.—London made, £4 12s. 6d. to £4 15s.

Copra rather steadier. Malabar, April-May, £27 2s. 6d. sellers, and May-June, £27 2s. 6d. Hamburg. Ceylon, April-May, £26 15s. sellers Hamburg. Java, March-May, £25 13s. 9d. paid and sellers, and May-July, £25 10s. sellers Holland, Hamburg and Bremen. Macassar, March-May, £25 7s. 6d. sellers Holland, Hamburg and Bremen. Singapore, April-May, £25 15s. sellers Hamburg. Cebu, April-May, £25 7s. 6d. sellers. South Sea Island, April-May, £25 5s. sellers London. F.M. Straits, April-May, £25 10s. sellers Marseilles. Manila, April-June, £24 12s. 6d. sellers, and May-July, £24 7s. 6d. paid and buyers Marseilles. Mixed no Padang April-June, £24 10s. sellers, and June-July, £24 10s. Marseilles, all c. and i., delivered weight.

With regard to Coco-nut Oil, Messrs. Goodlake and Nutter (May 16th) reported that there was not much "give" in the Colombo market. Prices have been gradually declining here, and Ceylon June-July could be purchased at 38s. 10½d. c.i.f. London, but even at this price there were no buyers. America seems still very inactive, and we get no inquiries at all. Cochin Oil was a nominal market, and we quote £42 5s. May-June and June-July shipment. There has been a very good demand for near Palm Kernel Oil, and up to 38s. 6d. has been paid for May, but there are now sellers at 38s.; June, 37s. 9d.; July-December, 37s. 6d. f.o.b. Hamburg. Pressed was a dull market, and there were sellers of May-June at 37s. 9d. September-December, 37s. 4½d. Spot prices: Ceylon, £40 to £42; Cochin, £48 to £52.

ACCORDING to reliable statistics, says the *Indian Trade Journal*, the export of soy beans from the port of Vladivostock for the past five years is as follows, and shows the heavy increased demand from Japan and China, especially during last year as compared with 1912:—

Year.	To Europe. Tons	To Japan. Tons	To China. Tons	Total. Tons
1913 ..	221,099	77,186	16,909	315,194
1912 ..	282,547	40,373	5,635	328,556
1911 ..	407,213	20,201	1,891	430,310
1910 ..	258,270	7,061	..	266,331
1909 ..	214,185	1,161	406	215,752

The export of beans from the Siberian port, according to these figures, increased yearly until 1911, since when a downward tendency has appeared. It is also noteworthy that whilst the export to Europe has been declining since 1912, that to Japan and China has been going up.

The India-rubber Market.

UP at Liverpool the Pará market has been dull and easier, and values are: Hard fine spot and May-June, 2s. 11½d.; June-July, 3s.; and July-August, 3s. 0½d.; soft fine, May-June, 2s. 9d.; scrappy negroheads, 1s. 10½d.; and Peruvian ball, 1s. 10d. per lb. Medium Brazilian grades have been quiet, with only a limited business passing. The African market has been steady, and the sales reported amount to 25 tons, including African Plantation Crêpe, 2s. 3d.; large and medium Lahou cakes, 1s. 6¾d. to 1s. 7d.; Conakry sheets, 2s.; Bata ball, 1s. 3d.; Manoh cubes, 1s. 9¼d.; selected Gold and/or Ivory Coast lump, 1s. 1d.; Accra paste, 9d.; Conakry niggers, 1s. 9d. to 1s. 9½d.; and Assinee strings, 2s. 1d. per lb.

In London the fluctuations during the auctions of April 21st to 23rd were somewhat remarkable. No. 1 Crêpe opened at 2s. 11½d., 3d. over the close of last sale, and it kept fairly steady throughout the first day, finishing up at about 2s. 11d., then it dropped to 2s. 9½d. gradually falling to 2s. 8½d. before the end of the day. The slump continued on the third day of the sale, 2s. 7¼d. being the final price recorded. Smoked Sheet opened at 2s. 9½d., 2d. per lb. below Crêpe; at the close, however, the position was reversed, Smoked Sheet at 2s. 7¾d. commanding a premium of ½d. per lb., whilst 3s. was paid for Standard Crêpe last week, for the first time since June, 1913.

After that, report Messrs. S. Figgis and Son, the market kept firm, though with only a small business in forward delivery, May Crêpe selling up to 2s. 8d. and Ribbed Smoked Sheets at the same price.

At the auctions, on May 5th to 7th, 1,175 tons were offered and mostly sold at irregular prices; there was a decline of a penny during the sale, which closed at the previous week's lowest prices.

Against Standard Crêpe now 2s. 6 $\frac{3}{4}$ d., Hard Fine Pará 2s. 11 $\frac{1}{4}$ d., forward 3s., Soft Fine 2s. 9d., and Caucho Ball 1s. 10d., the prices in the sale were:—

Plantation Malaya (1,008 tons sold).—Crêpe, Standard Latex, thin and thick, 2s. 6 $\frac{3}{4}$ d. to 2s. 8d.; stained and streaky palish, 2s. 6 $\frac{1}{4}$ d. to 2s. 7 $\frac{1}{2}$ d.; light brown and grey, part streaky, 2s. 5d. to 2s. 6 $\frac{1}{2}$ d.; fair to good clean brown, 2s. 3d. to 2s. 5 $\frac{1}{2}$ d.; dark and specky brown, 1s. 10d. to 2s. 2 $\frac{3}{4}$ d.; dark and black, part pressed, 1s. 9 $\frac{1}{2}$ d. to 2s. 3d.; dark and black, inferior, 1s. 6d. to 1s. 9 $\frac{1}{2}$ d.; dark to good smoked, 1s. 11 $\frac{1}{4}$ d. to 2s. 6 $\frac{1}{4}$ d.; cured by "Byrne" Process, dark to good (Sheets 2s. 5 $\frac{3}{4}$ d. to 2s. 6 $\frac{3}{4}$ d.), 1s. 11 $\frac{1}{2}$ d. to 2s. 7 $\frac{1}{2}$ d. Sheets, Standard Smoked (Highlands 2s. 8 $\frac{3}{4}$ d. to 2s. 9 $\frac{1}{4}$ d.), 2s. 6 $\frac{1}{2}$ d. to 2s. 8 $\frac{1}{4}$ d.; damp, mouldy, and part smoked, 2s. 4d. to 2s. 7 $\frac{1}{2}$ d.; fair to fine unsmoked, 2s. 6d. to 2s. 6 $\frac{1}{4}$ d.; damp, mouldy, and stuck (very inferior 2s. 0 $\frac{1}{2}$ d. to 2s. 2d.), 2s. 3d. to 2s. 5 $\frac{3}{4}$ d. Block, fine pale Lanadron, 2s. 7 $\frac{1}{4}$ d. to 2s. 7 $\frac{1}{2}$ d. Scrap and Virgin, fair to good, 1s. 9d. to 2s. 0 $\frac{1}{4}$ d.; mixed and inferior, 1s. 2d. to 1s. 8d. Rambong, Crêpe, nothing offered; scrap and block, 1s. 11 $\frac{1}{2}$ d. to 2s. 1 $\frac{3}{4}$ d. Ceará, Sheet (Castilloa Sheets 1s. 9d. to 2s. 1 $\frac{1}{2}$ d.), 1s. 11 $\frac{1}{2}$ d. to 2s. 3 $\frac{1}{4}$ d.

Ceylon (167 tons sold).—Crêpe, Standard Latex, thin and thick, 2s. 6 $\frac{3}{4}$ d. to 2s. 8d.; streaky and stained palish, 2s. 6 $\frac{1}{4}$ d. to 2s. 7 $\frac{1}{2}$ d.; light brown and grey, part streaky, 2s. 5 $\frac{1}{4}$ d. to 2s. 6 $\frac{3}{4}$ d.; fair to good clean brown, 2s. 3d. to 2s. 5 $\frac{1}{4}$ d.; dark and specky brown, 1s. 10 $\frac{1}{2}$ d. to 2s. 3d.; dark and black, part pressed, 1s. 10d. to 2s. 2d.; smoked fair, 2s. 3d. to 2s. 3 $\frac{3}{4}$ d. Sheets, standard smoked, 2s. 6 $\frac{3}{4}$ d. to 2s. 7 $\frac{3}{4}$ d.; damp, mouldy and part smoked, 2s. 6d. to 2s. 7 $\frac{1}{4}$ d. Sheets and Biscuits, fair to fine unsmoked, 2s. 5 $\frac{3}{4}$ d. to 2s. 6 $\frac{3}{4}$ d.; damp, mouldy and stuck, 2s. 4 $\frac{1}{4}$ d. to 2s. 6d. Scrap and Cuttings, fair to fine, 1s. 9 $\frac{1}{2}$ d. to 2s. 0d.; mixed and inferior, 1s. 4d. to 1s. 7d.

Manihot.—Pressed Pats 1s. 9 $\frac{1}{4}$ d., Pressed Crêpe 2s. to 2s. 0 $\frac{1}{4}$ d., Biscuits 1s. 11 $\frac{3}{4}$ d.

Mozambique.—Pressed Reddish Crêpe 1s. 10d., Reddish Ball 1s. 9d. to 2s.

Congo.—Reddish Barky Twist 1s. 8d.

In mid-May the market for Plantation was rather firmer and a moderate business has been done. Standard No. 1 Crêpe sold at 2s. 5 $\frac{1}{2}$ d. to 2s. 5 $\frac{3}{4}$ d. and sellers, May delivery at 2s. 5 $\frac{1}{2}$ d. and buyers, June at 2s. 4 $\frac{1}{2}$ d. Smoked Sheet (ribbed) spot 2s. 5 $\frac{3}{4}$ d. sellers, May delivery 2s. 5 $\frac{3}{4}$ d.

Pará remained very quiet at about unchanged prices. Hard Fine on the spot closed 2s. 10 $\frac{1}{4}$ d. sellers, May-June delivery sold at 2s. 10d. and buyers, June-July 2s. 10 $\frac{1}{4}$ d. sellers. Soft Fine lower; May-June and June-July sold at 2s. 6d. and sellers.

Pará rubber statistics for the month of April (tons):—

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará	2,470	1,360	= 3,830	agst. 3,540	3,270	3,490
Shipments to Europe	920	490	= 1,410	„ 2,390	1,730	1,720
„ „ America	1,400	1,060	= 2,460	„ 1,120	1,350	1,110

Crop statistics.—June 30th, 1913, to April 30th, 1914 (10 months):—

		Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10.	
Pará	{	1913-14	26,500	7,690	34,190	36,970	33,380	32,720	35,780
Receipts		1912-13	29,210	7,760					
„ Shipts. Europe		13,690	4,140	17,830	21,010	17,260	16,870	19,250	
„ „ America		12,610	3,530	16,140	17,110	17,500	11,640	15,770	

MR. JOHN HAY, of Messrs. Hay and Co., 138, Leadenhall Street, E.C., has offered the management of the Exhibition a silver cup to the value of £10 10s. for the best essay dealing with Ceará rubber. No limit to the number of words is given, but the essay should deal with the subject in the most practical manner possible, and the following leading points are given as a guide to competitors: (a) Seed selection; (b) general growth; (c) planting space; (d) method of tapping; (e) preparation of the latex and rubber; (f) packing for shipment.

The competition will close on Monday, July 6th, 1914. Essays must be sent by registered post to: The Awards Committee, c/o Mr. A. Staines Manders, Exhibition Offices, 75, Chancery Lane (Holborn), London, W.C. Note: If sent after June 15th they may be addressed as above, Royal Agricultural Hall, London, N., instead of to Chancery Lane.

The Committee accept the essays only on condition that the judges' decision shall be final and without appeal.

Each essay must bear a *nom-de-plume* only, and must be accompanied by an envelope in which the name and address of the competitor is enclosed, the *nom-de-plume* only appearing on the outside.

Sugar.

MESSRS. C. CZARNIKOW, LTD., writing on May 7th, said that the London market took no notice of an American improvement from 3.04 to 3.10 cents, equal to 9s. 7 $\frac{1}{2}$ d. c.i.f. New York or 9s. 10 $\frac{1}{2}$ d. c.i.f. U.K., nor of the reduction to 144 against 166 in the number of Cuban factories, nor of late ground frosts in Germany which damaged some roots and potatoes, necessitating re-sowings, which may slightly increase the Beet area. The tendency was easier because beneficial showers fell in most districts, and because May had to be liquidated or transferred to August and new crop, whilst refiners were unable to buy it owing to the increasing list of Cuban charters, which is not even complete yet, and will probably reach or exceed 300,000 tons against about 250,000 tons last season.

At the same time business had come almost to a standstill waiting for the Budget published on May 4th, which, however, contained no alteration in the sugar duties, expected by many dealers. But deliveries were delayed, as duty was paid only on the barest requirements, and the result is that visible stocks increased 27,000 tons (though imports were 27,000 tons less), and deliveries decreased 50,000 tons against last year. There exists no doubt a corresponding shortage in invisibles, especially refined, of which the visible stocks are very heavy, but it may take more than a month to transfer this from visibles. Meanwhile, April statistics all round will probably feel the effect of the stagnation in U.K. The American market prospects should be rather encouraging, but

we have first to digest the Cuban steamers already sold to Europe. The Hamburg stock meantime is increasing, as May sugars had to be warehoused for want of buyers.

The American market has again been firmer, and 3.10 cents = 9s. 7½d. c.i.f. New York, was paid by speculators for late May, and even higher prices for June Cubans. Refining grades of cane sugar in the U.K. have been firm in tone, but very little business has been passing. Grocery Crystallized sold in moderate quantities at about previous rates. As regards cane-producing countries there is nothing fresh to report.

The total transactions of British West India reported for the week amount to about 5,500 bags. Crystallized Demerara, middling palish and yellow, 13s. to 13s. 1½d. duty paid; fine yellow, 14s. 7½d. to 15s. 4½d. Crystallized Trinidad, middling yellow to good middling ditto, 13s. 3d. to 13s. 6d.; good bright yellow, 14s. 3d. Crystallized Jamaica, good middling palish yellow, 13s. 1½d.; Syrups, palish yellow, 11s. 3d. to 11s. 6d. 1,200 bags Crystallized Surinam sold, low yellow to middling greyish yellow, 12s. 9d. to 13s. 3d. duty paid.

Up in Liverpool about 1,500 bags Peruvian soon due sold at 8s. 3d. floating, landing, Clyde, basis 89 per cent. polarization; about 1,800 bags arrived and due at 8s. 9d. quay tel quel. 1,250 bags Brazilian Syrups changed hands at 8s. quay, tel quel.

The London Cocoa Market.

By THE EDITOR.

THE cocoa market at the time of going to press seemed to be suffering from indigestion on account of an over-supply of Accra kinds; my diagnosis as to the cause of the apathetic state of the market may be wrong, but I have every reason to believe that if Havre did not still possess a stock of over 80,000 bags of Accras alone, and if the output of this growth had not been so substantial, the market would be more certain as to how to act, and so more willing to buy than they have shown themselves to be for some time past, even when importers have shown themselves willing to take lower prices. Another growth which has also been a disturbing element is Bahia, for whilst comparatively harmless in itself because the cocoa is so inferior in quality, the output has been substantial. This was due to the accumulations up in the interior, especially in Ilheos, on account of the floods. When the great floods came, at the end of January, the crop was finished, but at some of the centres and especially in the Ilheos district a large amount of cocoa was still in the depôts on the estates. There it had to remain for a long time as the railway was injured by the floods and the repairs necessary, before traffic could be resumed, took some time, so that it was only towards the end of March that the trains could run regularly and bring down the accumulations from up-country, which must have been around some 50,000 bags. These go by train to the shipping port of Ilheos and thence by boat to Bahia City, and no doubt many have wished that the cocoa had been washed away in the floods, for it has suffered by its sojourn up-country, whilst the quantity dumped down on the market at

this stage will increase importers' difficulty to effect sales, especially of that class of cocoa which is in over-supply; this being so, will affect the better-class grades as well. Towards the end of last month I understand that, although the market dragged, the supply of superior Bahias in the city of that name was so light that probably not more than a thousand bags of really superior quality could have been shipped that week had an order come in for prompt delivery. If this was so, and I have no doubt but that the estimate was correct, buyers were not disturbed by the knowledge, for they still maintained that prices all round were too high to make it worth their while to buy for stock, and that if producers expected them to do so, prices must come down lower. Planters do not agree with this, for they argue that the heaviest period as regards the output has passed in the West Indies, in West Africa, and elsewhere, whilst the crops in Bahia will be late, for over there nothing of importance can be looked for until August or September, as it was only in March that the trees began to flower and the resultant crop from this floraison is still far from certain, and so temporarily there is a deadlock, and neither side is satisfied.

The crop that continues to flourish and pour forth its exports is Guayaquil. The receipts to the middle of May show a substantial gain even upon 1912, working out at 469,800 bags, against 228,500 last year, 401,500 in 1912, and 320,300 bags in 1911.* Meanwhile business has been done in this growth mainly in Caraquez at 56s. to 58s., and Machala on the same basis, whilst Arriba is valued at 60s. to 68s.

Stocks run as follows:—

Havre Stock, April 30th—	1914 Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Pará	8,187	73 to 76	15,932	83 to 88
Bahia	15,477	65 „ 75	14,532	82 „ 86
Venezuela	48,521	80 „ 200	35,351	90 „ 185
Trinidad	33,447	69 „ 74	21,461	86 „ 95
Grenada and O.W.I.	2,445	68 „ 74	4,307	80 „ 87
San Thomé	8,162	74 „ 78	9,380	86 „ 88
San Domingo	972	64 „ 67	5,915	74 „ 78
Haiti	10,817	58 „ 75	7,136	69 „ 82
Accra kinds	80,509	66 „ 70	62,043	76 „ 80
Guayaquil... ..	32,811	74 „ 80	20,271	88 „ 95
Various	9,567	—	9,538	—
Totals	250,915 bags		205,866 bags	

London Stock, May 6th—	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads	9,030	7,756	7,955
Grenadas	14,825	7,880	7,001
Other W.I.	4,207	3,166	7,993
British Africa	17,936	9,807	11,244
Portuguese Africa	3,623	7,194	4,835
German Africa	2,423	5,310	5,945
Ceylon and Java	10,785	24,444	17,483
Guayaquil	28,650	11,606	44,096
Brazil and Bahia	1,191	457	2,804
Other Foreign	8,639	7,521	7,188
Totals	101,309	85,141	116,544

Coming to consumption, I see that with regard to the Board of Trade returns for the United Kingdom to the end of April, the deliveries of raw cocoa for home consumption show an increase, whilst the

* The Guayaquil figures printed in the last report were incorrect, they should have read 321,000 qtls. against 121,500 last year, 304,500 for 1912, and 194,800 qtls. in 1911.

imports and deliveries of foreign manufactured again show a fairly substantial decrease, say:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Apr. 30th.) Tons.
Jan.-Apr., 1912—	14,973	9,177	2,228	13,228
„ 1913—	15,109	9,466	2,796	11,826
„ 1914—	20,343	11,295	2,647	16,502
Incr. 5,234	Incr. 1,829	Decr. 149	Incr. 4,676	

In April only 2,397 tons of raw cocoa were delivered for H.C. against 1,985 last year and 2,549 tons in 1912. Against this the movements of the foreign manufactured article were:—

Foreign Manufactured—	April only Landed.	Del'd H.C.	Jan.—April. Landed.	Del'd H.C.
1914 ...	774 ...	775 ...	3,431 ...	3,487 tons
1913 ...	1,028 ...	996 ...	3,910 ...	3,861 „
1912 ...	595 ...	668 ...	3,142 ...	3,394 „

Sales have been irregular, so, at times, have prices, which have ranged as under:—

Trinidads.—After a dragging market private sales were made, including good red Trinidads at 60s. against 63s. as reported last month. It is, perhaps, worth noting that the Trinidad exports (from that Island) for March were the heaviest on record for any single month, nearly 70,000 bags having left Port of Spain during that period, roughly divided into 32,000 for Europe, and 38,000 bags for America. Whilst April continued to send forth substantial exports, the planters do not seem to expect that the 1913-14 crop as a whole will be anything very wonderful, and, although well ahead at present, there seems doubt as to whether it will exceed last year's output (236,182 bags for October, 1912, to September, 1913).

Grenadas.—After a good deal of bargaining, a substantial quantity, about 10,000 bags, have changed hands at prices that tend downward with an irregular movement. At the moment fine marks are worth up to 57s. 6d., fair to good red 52s. to 54s. or 55s., and common unfermented to fair fermented 50s. to 51s.

St. Lucia.—Fine last sold or was valued at 58s., good to fine realizing 55s. to 57s., whilst low unfermented must be valued at 48s., and common to fair 50s. to 53s.

Dominicas.—Good red sold at 53s. to 54s., and common to fair are worth 49s. to 52s.

Jamaicas.—Fine is valued at 60s. or 61s., though sales are difficult on that basis.

British West African.—Has been selling up at Liverpool at 49s. to 52s., and another parcel at 48s. 6d. to 52s. 6d., but the market drags, and transactions are difficult to bring off.

Bahia.—Are quoted up to 62s. for superior, against 58s. for San Thôme, and 58s. for Cameroons.

Guayaquils.—Up to mid-May had been selling at 56s. to 58s. for Caraquez, whilst Arribas are valued at 60s. to 64s. Sales lately have been larger.

Ceylons.—Are steady, but the supply, especially of the best grades, is not large; fine bold is worth 80s. or more, fair to good medium and bold 75s. to 78s.

At the sales on May 11th Trinidads went at 60s. for good mid red, and 62s. for good red, showing a rise of 2s. As the output has been fairly well taken up prices should remain firm. Fine Grenadas sold at 57s. 6d. to 58s. No sales were held on May 18th.

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. X.—No. 6.]

JUNE, 1914.

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Our Books.

THE latest press notices on our last two books, viz., "The Fermentation of Cacao," and the second edition of "Coco-nuts—the Consols of the East," will be found on advertisement page, to which we must refer our readers. Our best thanks are due to our contemporaries for their kindly remarks in the many important reviews that the books have received.

The Coming Congresses on Tropical Agriculture.

"TROPICAL LIFE'S" SHARE IN THE PROCEEDINGS.

THE time for going to press found us all busily preparing for the third International Congress of Tropical Agriculture at the Imperial Institute, under the presidency of Professor Wyndham Dunstan, C.M.G., &c.; for the Rubber and Tropical Exhibition, under the management of Mr. Staines Manders, and for the Rubber Congress to be held at the Agricultural Hall. For the latter we have all but completed our paper on the manuring of rubber, a delay having occurred through certain data not having yet come to hand; by the end of the week, however, we shall, no doubt, all be ship-shape and absorbed in listening to the papers at the Imperial Institute; or comparing notes on the exhibits at the 1914 Rubber Exhibition with those of its predecessors.

The President (Professor Dunstan) and the joint secretaries (Dr. T. A. Henry and Mr. Harold Brown) have done wonders during the past month in bringing their Congress up to time so as to be ready with their arrangements when the opening meeting and reception of delegates and representatives takes place on Tuesday, June 23rd, at 11.30, to hear the President's address. It may be as well to remind our overseas readers who may not have been following the two Congresses as closely as we who are on the spot have done, that the one to be held at the Imperial Institute, under Professor Wyndham Dunstan, is quite distinct from and independent of the Rubber and Tropical Congress and Exhibitions under the presidency of Sir Henry Blake, G.C.M.G., and the management and direction of Mr. Staines Manders. Although the exhibitions will be running whilst both the Congresses are on, the Rubber and Tropical Congress does not begin until the one at the Imperial Institute has concluded its labours.

The official programme of the Imperial Institute Congress has been put up in book form, and covers over fifty pages. By it we see that Lord Kitchener, K.P., &c., will take the chair at the morning session (from 11 a.m. to 1.30 p.m.) on Monday, June 29th, when various papers on cotton will be 'up' for

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consideration, including one by Mr. G. C. Dudgeon, of the Egyptian Ministry of Agriculture, and Mr. J. S. J. McCall, Director of Agriculture, Nyasaland, two of "Our Friends." Other chairmen will include Professor Dunstan, Sir Ronald Ross, the Earl of Derby, Sir Edward Rosling (Ceylon), Sir Louis Dane, Sir Sydney Olivier, Sir Hugh Clifford, Sir Hesketh Bell, the Rt. Hon. Lewis Harcourt, M.P., Secretary of State for the Colonies, whilst Lord Emmott, Under-Secretary of State for the Colonies, will be among the speakers on "The Work of the British Cotton Growing Association."

The papers sent exceed, we understand, two hundred, and include some of prime importance contributed by leading authorities throughout the world. Mr. Lyne, from Ceylon, Mr. Simpson, from Nigeria, and Mr. O. W. Barrett, from the Philippines, have already arrived, and so has Professor Karutz, from Cuba, and many others. We are "billed" to read our paper on "The Necessity of Establishing a British Tropical Agricultural College in the Western Hemisphere," on the first day, which is to be devoted to the subject of Agricultural Education in the Tropics, on which Mr. G. C. Dudgeon, Dr. Francis Watts, Imperial Commissioner of Agriculture, Barbados; M. Edmond Leplae, Director General of Agriculture, Colonial Office, Brussels; and Mr. W. H. Patterson, Government Entomologist at the Gold Coast, have also contributed papers.

As regards the social side, Earl Beauchamp, on behalf of His Majesty's Government, has issued invitations to a reception on the evening of June 23rd, when

Mr. Lewis Harcourt will receive the guests. The next evening the Royal Colonial Institute are extending their hospitality to the delegates at a reception to be held in the Natural History Museum, close by the Imperial Institute, and various excursions will be made to places of interest outside London.

Of the Rubber Exhibition we gave last month a note of the various receptions, &c., to be held in connection with them. Of the papers to be read at the Congress we have not yet received particulars, but those who wish to hear the last word on rubber production and preparation will not be disappointed in the quantity and quality of the papers laid before them. Already we have experienced the advantages of holding these periodical congresses, having had some pleasing and instructive interviews with those over here to take part in them. One point that stands out prominently as a result of these is the great attention being given to oil-yielding crops abroad, and the increasing tendency to express the oil, and even manufacture it into edible butter, soap, &c., at or near the centres of production. Judging by the number of inquiries we are receiving for books on margarine making, coupled with the news to hand of the extension of the oil mills and machinery in Manchuria, China, the Philippines, and elsewhere, those engaged in the vegetable oil trade, either as producers, shippers, manufacturers, or refiners of oil, soap, or edible butter, as well as the engineers, have a busy and prosperous time ahead of them. In connection with this, the article on p. 112 in this issue, on "The Shipment of Coco-nut Oil in Bulk," is worthy of attention.

Suggested Designs for "Tropical Life" Medals for the Rubber, Fibres, Cotton, and Tropical Products Exhibition.



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The Practice of Cacao Fermentation.

By ARTHUR W. KNAPP, B.Sc.Lond., F.I.C.,
B.Sc.Birm.

(Continued from p. 83.)

PART IV.

APPENDIX C.

HOW TO SUCCESSFULLY FERMENT SMALL QUANTITIES.

It is sometimes said that it is impossible to obtain a good fermentation in a box smaller than a cube 4 ft. each way. It is true that the results are unsatisfactory unless special precautions are observed to prevent the escape of heat.

FERMENTATION OF SMALL QUANTITIES.

	Box, 3 ft. x 2 ft. x 2½ ft.	Barrel, length 2 ft. 2 in., dia- meter 1 ft. 4 in.	Box, 1 cubic foot
Position ..	Unprotected	In a shed	Embedded in a large mass of beans
Temperatures ...	Degrees Cent.	Degrees Cent.	Degrees Cent.
After 1 day ...	26	27	32
„ 2 days ...	27	33	39
„ 3 „ ...	32½	44½	46½
„ 4 „ ...	32	47	48½
„ 5 „ ...	34	48	50

These results show that it is not the size of the box, but the amount of protection from cooling, which determines the temperature and fermentation. The beans in the unprotected box were not fully fermented. Those in the barrel, which was protected from air currents by placing in an unused sweat-box, were well fermented and plump, and were equal in every respect to those obtained by fermenting 10 cwt. lots. When roasted they produced an equally good cocoa (see p. 104).

When fermenting small quantities, such as would produce 50 to 100 lb. of dry beans, they should be placed in a box which they almost fill. The box must be first lined and the beans well covered with banana leaves. The box should be placed in another box somewhat larger and prevented from touching the bottom by resting on logs. The outer box should also be similarly raised and both boxes should be slightly perforated at the bottom to allow the sweatings to escape. The whole should be covered by a loosely fitting lid, and may be freely exposed to the sunlight to keep warm. Small quantities are apt to dry up before fermentation sets fully in, so that the first two days' sweatings should be collected in a clean vessel and sprinkled over the beans. (If there is little pulp on the beans a solution of glucose, where available, may also be used.) After the first two days the beans should be emptied into the larger box, mixed, and put back into the smaller box. This should then be repeated each day.



Fermentary containing twelve sweating-boxes. The channel for sweatings is at the back.

APPENDIX D.

THE PODS.

These should neither be unripe nor over-ripe. It is immaterial, however, whether they are just full and mature, or quite ripe. The following analyses, which were very kindly done for me by the Trinidad Department of Agriculture, show that one of the most important constituents, the fat, is practically the same in both cases. The two pods (Calabacillo) were taken from the same tree.

BEANS (SHELLED) IN THEIR NATURAL CONDITION.

		Full pod		Ripe pod
Water	...	35.12 per cent.	...	30.64 per cent.
Fat	...	36.70 per cent.	...	39.20 per cent.

BEANS (SHELLED) DRIED AT 100 DEGREES CENT.

Fat	...	56.56 per cent.	...	56.51 per cent.
-----	-----	-----------------	-----	-----------------

APPENDIX E.

USE OF PLACENTA OR "GUTS."

It is contended by some planters that leaving in the placenta improves the flavour of the bean. Their presence in the sweat-box is certainly very useful when the pulp on beans is dry. They should, however, be pulled apart from the beans, as otherwise the beans which remain fixed to the placenta do not get thoroughly fermented. The improved fermentation compensates for the trouble of removing them during drying.

COVERING.

Sacking is used by some planters, but its use cannot be recommended. It soon becomes very dirty and is liable to produce mould. It is usual to leave the beans uncovered the first night, thus the planter allows the minute yeast cells floating in the air to settle upon them.

APPENDIX F.

TURNING.

Only a few planters "turn" the beans every day. Whilst this is not absolutely necessary, it ensures

even fermentation. There is a loss of heat on turning, which varies roughly with the time taken and the temperature of the surroundings.

LOSS OF HEAT ON TURNING.

Weight of Cocoa.		Before. Degrees Cent.		After. Degrees Cent.		Loss on Turning. Degrees Cent.
9 cwt.	...	49	...	39	...	10
1 „	...	48	...	41	...	7
9 „	...	46	...	43½	...	2½
9 „	...	39	...	36	...	3

LABOUR SAVING.

The present method of turning is slow and laborious. It would be rendered easier—

(1) If the sweat-boxes were built upon a hill, or a made inclined place, the bottom of the first box being level with the top of the second, the bottom of the second level with the top

Tobacco Planting.

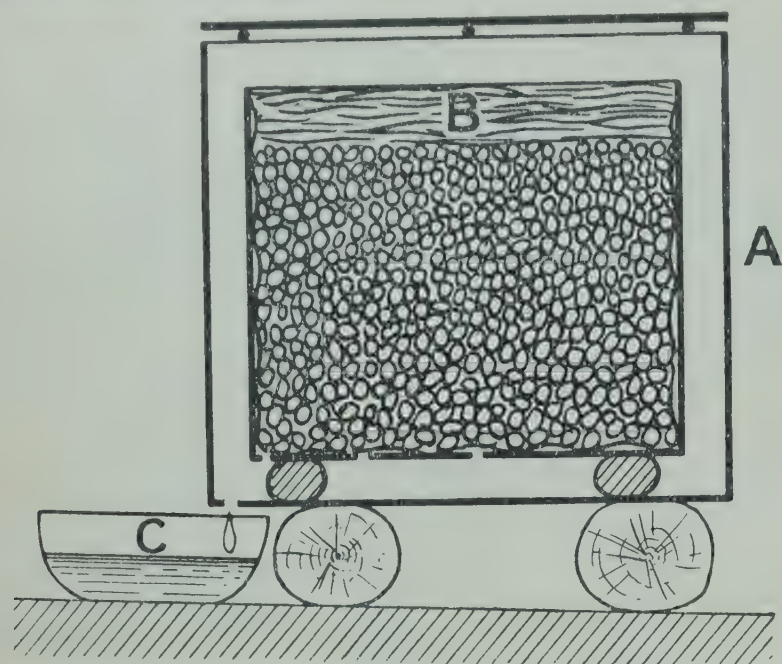
PART VII.

IN the December issue, when we published the first of this series of articles, we mentioned many of the chief varieties of tobacco, and the cost of laying out an estate in Tirhoot; in January we discussed soils and then went on to manures; then, in March, we quoted Mr. Valabone on tobacco planting in Ceylon, and gave particulars of the different tobaccos grown at the various centres; whilst in May we touched upon tobacco cultivation in Russia, and reviewed, quoting a leading London manufacturer's views, the tobacco market and prices realized during 1913.

All this time, therefore, we have not discussed the actual laying out of the soil as we would have liked to have done, but as it was necessary for the planter to first know which variety he should cultivate, we thought it best to say what kinds were recommended or being planted at each centre before coming to details of how to select seeds, prepare the seed-beds, and so on. Now we will do so.

Quoting Mr. J. W. Harper again* we can first say that it is necessary to thoroughly prepare the soil in making preparation for a seed-bed for young tobacco plants. The bed should be located in some well-protected place and should have a southern exposure so as to obtain as much heat from the sun as possible. The bed should be burned thoroughly to destroy all weed seed and insect eggs, and this will also put the soil in good physical condition. The bed should be protected by being surrounded by boards, and the upper side should be ditched to prevent water from flooding it. The bed should also be protected in the early spring by cotton canvas. The seed should be sown after the bed has been burned and ploughed, then cleared of all stones and trash. The seed should be sown at the rate of one thimbleful to every 36 square ft. Before sowing the seed the light ones should be separated from the heavy ones and the latter (the heavy ones) only should be sown. It has been proved the plants grown from light seed produce not only a very small yield, but also tobacco of an inferior quality. Regarding the selection of seed no plant so readily responds to a careful selection as does tobacco. As it crosses easily, it is necessary, to improve the seed, to place a sack over the flowers before the pistil is ready to receive the pollen, thus preventing insects from bringing pollen from undesirable plants and cause crossing. The first step in saving seed is to select the type of tobacco that one wishes to grow. It is easy to pick out a desirable tobacco plant, because all of its characteristics are before the eye. If one is breeding for a long leaf, a broad leaf or a narrow leaf, a plant that holds its leaves up well or one that has long or short internodes or one that has pointed or round leaves, fine or coarse veins or width between the veins, he can easily do so by selecting his plant and protecting its pistil from cross-pollination. All lateral flowers should be pulled off leaving only a few at the top. A few days before the pollen is ripe a sack should be placed over the flowers in order to prevent any possible cross-fertilization. If, on the other hand, the planter wishes to cross or hybridize

* Syllabus of "Illustrated Lecture on Tobacco Growing," by J. N. Harper, Director Agricultural Experiment Station, Clemson College, South Carolina, U.S.A.



A, outer box slightly inclined to one corner; B, leaves; C, sweatings.

of the third, and so on, the boards at the sides of the boxes being as usual, removable; or (2) a false floor, about half the width of the true floor, might be arranged in each box, so that it could be raised through the beans by means of weighted ropes over pulleys. By this device mixing could be accomplished in five minutes.

(To be continued.)

Dr. Friederichs (Samoa) and the Nasicornus Beetle Fungus.

REFERRING to the article on the Nasicornus Beetle Fungus sent us by Mr. H. J. Moors, of Samoa, which we reproduced both in our book on Coco-nuts (pp. 449-456) as well as in TROPICAL LIFE (November, 1913, p. 213), we are glad to see by the *Samoaanische Zeitung* that the beetles are unquestionably declining in numbers, though still too plentiful. The efficacy of the "Friederichs Fungus" has been strikingly illustrated in the uncovering of some forty large tumus (described in detail by Mr. Moors) in the vicinity of Mr. Peemueller's place. All of these were supposed to be infected. Formerly a gathering would probably have amounted to between 3,000 and 4,000 larvæ. This time not a single live larva was found in 35 of the tumus; in the remaining two, where perhaps the infection did not work, some 295 larvæ and 35 beetles were gathered. Dr. Friederichs and Samoa are both to be congratulated on so successful an attack on this most serious of coco-nut pests. By the way, our Samoan contemporary in discussing the troubles beetles are said to be giving coco-nut planters in Madagascar, goes on to say that the beetle "apparently is not reckoned as a very serious pest. It is quite possible that some local parasite or fungus, or climatic condition serves to keep this pest well in check, and, as Dr. Friederichs is to visit Madagascar on our behalf we sincerely hope that he will find there some ideas which may be of much benefit to all coco-nut growers wherever located."

The whole question is, we are glad to see, being exhaustively discussed in the columns of our contemporaries, and there is no doubt that all thinking men are closely following Dr. Friederichs' work and its results. Many of us are wondering whether fungi to check other pests cannot be discovered; perhaps the matter will come up at one or other of the congresses about to take place.

two kinds, he can do so by taking the stamens out before the pollen is ripe, and the day after by applying to the flower from which the stamens were removed the pollen from another plant by means of a camel's-hair brush. All small leaves, suckers and lateral branches immediately below the seed-head proper should be carefully removed and the mouth of the bag tied around the stalk just under the lowest remaining branches. Many of the improved varieties of tobacco have been brought about by crossing standard varieties, and many standard varieties, such as the white burley, have been improved by careful selection and the prevention of cross-pollination with undesirable kinds.

Having, therefore, chosen your variety and secured the seed you require, before sowing same mix it with a good quantity of corn (maize) meal. This will dilute the seed to such an extent that it will be possible to sow them evenly and not give too great a quantity to the one bed. Four seeds to the square inch is sufficient, and the planter has to see to it, so far as is possible, that each square inch does not, as a rule, get more than its four seeds. The seeds should be tested for their germinating power before planting. This can be done by placing a definite number, say 100 seeds, on a moist piece of blotting paper in a broad glass jar and keeping same moist in a dark warm place. In a few days all the good seed will germinate. The seed should be sown early in the spring and raked in.

(To be continued.)

Plantation Rubber Machinery of the Future.

To the Editor of TROPICAL LIFE.

SIR,—I am, as shown by my name, completely unbiased as regards which method will be finally adopted as being *the* best for preparing rubber (be it Eastern Plantation or Amazonas Wild) for market so long as we are certain that the right one will come along for us to adopt. Maybe it has already been invented and is hidden away unknown, unseen, untried and awaiting a chance, like the (1914) London Rubber Exhibition, to prove its superiority against all comers.

For this reason I cannot but regret to hear that the leading English firms (who, being the pioneers in the making of machinery for tropical estates, are well known to all rubber growers) should, at the present critical stage in the history of estate machinery for preparing rubber latex for market, have decided to hold themselves aloof from the Rubber Exhibition and not show us where and how their machines are equal if not superior to the new-fangled patents that are being sprung upon us almost as often as tapping implements were a year or so back.

Instead, therefore, of our having all the old firms and systems filling one-half of the Agricultural Hall, and all the new methods and appliances lined up on the other side, this, the most important section of the exhibition, will be missing, and being so, how is anyone to learn how to prepare the tons and tons of rubber that will be seen on all sides, if none of the engineers are there to show visitors the machines that did the work in the past, and the improvements which will do it still better and cheaper in the future? Why this thusness? Is the

old brigade afraid of the new-comers? Do they believe that the present agitation for an apparatus to turn out the rubber without "tearing it or worrying it to death," will oust their machines from the estates? If this is not the case, are the engineers not making a very serious mistake in not coming forward to prove that after all the modern "crank" is "out of it" altogether, and that the old firms' creping, washing and pressing machines are still the best, and in fact that they are the "one and only" kind that are worth troubling about?

Messrs. Summerscales, Ltd., of London and Keighley, seem likely to be the only firm, or at least the only English firm, showing machines for treating rubber, but theirs are the small handy machines of the well-known "mangle" type of which, if I remember rightly, they are the pioneers. Will their machines in future be used so that the rubber (quoting Mr. R. N. Lyne, Director of Agriculture for Ceylon, in his interview with the *Ceylon Observer* regarding the visit paid by the representative of the Dunlop Rubber Company to that island) will not suffer "the harm done to it by over-milling"? They (Messrs. Dunlops) want the rubber as little touched as possible, and (Mr. Lyne continues) "seem to be rather inclined to favour the rubber being coagulated and dried before being smoked in preference to smoking the crude latex; that was, they apparently want the rubber sufficiently coagulated to allow of its being handled and then smoked, in preference to smoking the crude latex."

So far, so good, but whose process is it that answers to Mr. Lyne's description, or Messrs. Dunlops' alleged requirements? What is the name of the firm offering this process for sale, and will *they* be exhibiting at the Rubber Show? If they do not do so, after such an advertisement, they will have missed the chance of their lives—and so, surely, have several other firms; whilst we, who will be crowding to the hall to be taught, seem likely to learn nothing from the engineers. I can only suppose that, although the engineers will have contributed nothing towards the cost of running the exhibition, Mr. Manders, or Miss Fulton, with their usual good nature, will have all the rubber labelled with the name of the firm whose machine or process prepared the sample, so that the visitors can still go to them with their inquiries and orders. Mr. Manders, I am sure, will be only too delighted to do so, and so I shall look out for these details when visiting the Agricultural Hall.

Trusting that you will find space to insert this letter in your June number, I remain,

Yours truly,

All-at-Sea, June 1, 1914.

UNBIASED.

By the declaration of a final dividend at the rate of $3\frac{1}{2}$ per cent., the *Joint Stock Companies' Journal* tells us, the directors of the Royal Mail Steam Packet Co. have brought the full distribution on the ordinary stock for last year to 6 per cent., which is the same as was paid for 1912, and 1 per cent. more than in 1911. Hopes had been entertained that the shareholders would be favoured with a 7 per cent. dividend, but in view of the existing conditions of the shipping trade an increase was hardly to be expected, and at any rate general opinion is in agreement with the policy adopted by the board.

Tea Notes.

THE note we included in our March issue regarding the alleged statement of King George and Queen Mary as to their preference of China tea has attracted considerable attention in the columns of our exchanges, especially the *Ceylon Observer* and the *Indian Planter's Gazette*, the latter paper very truly saying that: "It may seem to savour of impertinence to discuss the private tastes of the Sovereign, but it must be remembered that his Majesty sets a fashion, and that a public statement of this character is at once pounced upon in order to advertise China teas of all grades, not only in this country, but throughout the world, to the detriment of a most important tropical industry which has been slowly and painfully created at no small expenditure of British lives and British gold. Think what capital would have been made had it been authoritatively announced a few years ago that the Emperor of China always drank Indian tea. Much more will be utilized the announcement, be it true or false, that the Emperor of India always drinks China tea. This may seem a trifling matter to good people who look on tea simply as a product of the grocer's shop, but I write as one who has been a planter himself and who has many friends among the planting community. It is no exaggeration to say that the belief that the personal patronage of the King-Emperor is not bestowed on their industry will cause deep disappointment throughout the tea districts of India and Ceylon, for be it borne in mind it is not as if the vintages of France were to be substituted by the newer growths of Australia or Cape Colony. The finest tea in the world is produced by some of the Himalayan tea gardens—leaf quite as delicate in flavour and constitution as anything that can be obtained from the Farther East."

Crowned heads, we feel quite sure, already have enough troubles of their own to smooth out, between foreign affairs, suffragettes, temperance and bird-plumage extremists, for us to wish to add to them by complaining about their tastes in tea. We can only hope, therefore, that whilst their Majesties may continue to enjoy for many years to come, both Indian and China tea, the general public in England will continue to prefer Indian and Ceylon blends as offering better value and being more invigorating.

Discussing the statistical position, Messrs. McMeekin and Co. tell us that both consumption and exports

have, owing to the increase in both, begun at an earlier date than last year to reduce the volume of stocks. There is not at the present moment any evidence that relief for the distributor is at hand, but if India during 1914 shows a progressive increase such as it did in 1913, and Ceylon and Java resume their interrupted development, the position may not be so strong by the end of the year. Fair quantities are now being produced and sold from the large tea extensions undertaken a few years back in the low country of Ceylon, and it is reasonable to expect that supplies may later in the year be more in proportion to the demand.

Returning to the subject of tea-seed oil, which we discussed fully in our May and June issues last year, we now see that, according to a report issued by the Bengal Chamber of Commerce and reproduced in the

Indian Trade Journal, Mr. A. K. Menon has been examining tea-seed oil of seed from Tinsukia, Assam. Petroleum ether extracted 16.1 per cent. of a clear straw-coloured oil, which deposited solid fats on standing. The oil had the following characters:—

Specific gravity	...	0.9028
Acid value	...	3.75
Saponification value	...	189.9
Reichert Meissl value	...	0.56
Iodine value	...	92.7
Unsaponifiable matter	...	2.65

The solid fatty acids melted at 57.8° C., and had the mean molecular weight of 267.3.

According to the *Tea and Coffee Trade Journal* of New York, Sir Thomas Lipton may grow tea in California, it being reported that he has notified his agents out there of the dispatch of several hundred three-year-old tea plants, in charge of an experienced tea-

planter, to San Diego, California, where a small experimental station will be established.

"When Sir Thomas visited California two years ago," our New York contemporary goes on to say, "he was much impressed with its possibilities for the growing of tea on a commercial scale, believing that the climate and the general conditions in the State were extremely favourable. It is his intention to plant a small acreage immediately, and if results are satisfactory he will send over a force of expert tea growers who will begin operations on large tracts, with the ultimate intention of supplying the American market with teas of the Lipton brand."

No doubt tea-planters out East will be interested in this "spec."

In their *Annual Review of the Tea Trade* just issued, Messrs. Wm. Jas. and Hy. Thompson point out that

Where Rubber is Used. No. 3.



No. 3.—Interior view of the North British Railway Hotel, Glasgow, showing the floor covered with rubber tiling made by The North British Rubber Co., Ltd., Edinburgh.

[Month by month we propose to include a photograph similar to the above, illustrative of the more modern uses of rubber, especially on a large scale.]

a summary of the past year's figures reveals a total export of tea from all countries of production of 754½ million lb., compared with 750¼ million lb. for the previous year. The past season may be described as an exceptionally favourable one for producers; crops have been short in some districts of India and in Ceylon, but more particularly in Java, and the quantity received from China has also shown a decrease; but the total deficiency has been more than made good by heavy yields in other districts of Northern India. A steadily increasing use of tea in this country has, moreover, been a very important feature in the year's trade, and this has been the chief factor in contributing to an unusually buoyant market throughout almost the entire twelvemonth under review (apparently to May 31st, 1914).

A broad summary of the outstanding features during the past year has been the moderate increase in the crop from Northern India, the heavy deficiency in estimated supplies from Java, the tendency towards a freer use of China teas, and the exceptionally favourable market conditions enjoyed by sellers. In Northern India the effect of improved methods of cultivation and treatment are more distinctly apparent in the case of areas producing low to fair medium quality crops. In Ceylon large areas still exist from which response should come to special treatment, and the less attractive position of rubber has influenced more attention to tea.

Producers, therefore, have enjoyed abnormally favourable realizing conditions, and though the measure of prosperity has not been equally distributed, generally speaking full compensation for reduced out-turns has been found in more remunerative prices and at the same time the cost of production has shown a marked tendency to advance.

Coming to current market news, Messrs. Thompson, writing on June 11th, reported that the easier tone apparent of late became accentuated during the week, and the market has assumed an irregular tendency, especially for New Season's Indians between 8½d. and 9d. per lb., and preferable quality has not always been reflected in quotations; but attractive liquoring sorts, especially from Darjeeling, have sold well. The Ceylon and Java sales have also passed with a rather quieter tone, and have occasionally sold at slightly lower prices.

Weather is favourable in Northern Indian districts, except in Assam, and want of moisture is interfering with out-turn, but quality may be good. The total crop was ahead of last year at the end of April.

The old season came to a fairly rapid close with a sale of 4,810 packages during the last week in May. New season's tea reached the market on May 18th, being about a fortnight earlier than in any previous year, 812 chests being catalogued from Assam, Dooars, and Darjeeling, and the brokers report that these early arrivals were above the average.

As regards Indian teas, the average paid for the whole sale on Garden Account was 9½d. per lb. compared with 8½d. per lb. a year ago. Ceylons realized 9d. per lb. as against 8¾d. per lb. at this time last year.

The London "Times" on Mr. Dean Worcester's Book.

READERS of TROPICAL LIFE, and especially of our book on Coco-nuts, will know the name of Dean C. Worcester quite well; but associated mainly with coco-nuts. Those, however, who have followed the excellent and exhaustive work done by the Philippine Bureau of Science since it was established, will not be surprised to know that Mr. Worcester has published a standard work in two volumes with 128 plates, entitled "The Philippines, Past and Present" (Mills and Boon, 30s. net). We were glad to see that the *Times* literary supplement of April 23rd devoted practically two columns in order to call the attention of the reading public to the work in a way that it deserves. "The author of this encyclopædic narrative," the *Times* tells us, "probably has a longer and more intimate knowledge of the Philippines and their inhabitants than any other American. He first visited the islands in 1886, when he took part in the biological expedition of Professor J. B. Steere, under whom he was studying in the University of Michigan . . . and he was the only member of the first Philippine Commission who continued (in 1900) to serve in the new one, of which he remained a member until his final retirement in September, 1913. . . . Thus for the first fifteen years of American rule in the Philippines Mr. Worcester has been at the centre of affairs. . . . It is the story of these fifteen years of hard and unceasing labour, with the aid of devoted colleagues and subordinates of whom he speaks with an enthusiasm that never fails to provoke the interest and admiration of the reader, which Mr. Worcester tells at length in these two invaluable volumes."

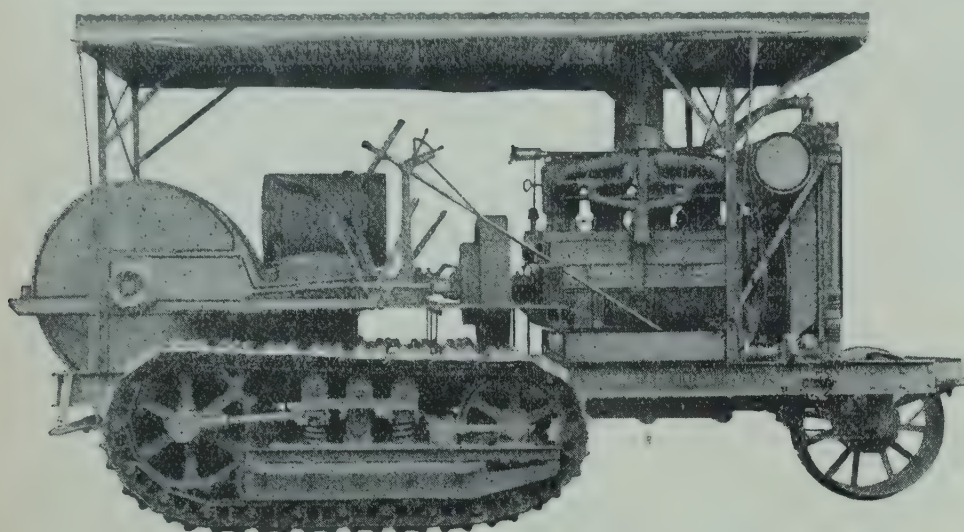
This is praise indeed, but those who have followed Mr. Worcester's career in the Philippines as we have, will agree that it is not too high and, like ourselves, they will be glad to see him receive it through so important a medium on this side of the Herring Pond.

A New Cover-Crop.

UNDER the above heading the *Kew Bulletin*, No. 2, for 1914, on p. 76, calls attention to *Dolichos Hosei*, named after Mr. E. Hose, who, last year, in *The Bulletin of the Federated Malay States*, we believe in February, 1913, p. 276, discussed this plant under the heading "Notes on a Creeping Bean," and so drew attention to its utility as a cover-crop since it had proved highly satisfactory when planted by him for that purpose in Sarawak. Quoting *Kew*, "Mr. Hose says that for five years he has been experimenting with various leguminous plants as cover-crops. His experience demonstrated to him that what was required was a low-growing leguminous plant which could be dug into the soil and which would reproduce itself in time to check the growth of weeds. He describes the plant, which he says is indigenous to Sarawak, as forming a thick level mass about 6 in. thick on the ground; it will grow on almost any soil, but a light one for preference, and in six months after planting, if placed 3 ft. apart, should prevent all wash. The trees, he adds, are ring-weeded monthly. The plant grows readily from cuttings, but seeds are difficult to procure, a fact which has been corroborated during the Kuala Lumpur experiments."

Tractors for Tropical Transport.

FOR some months past numerous columns in the pages of our contemporaries have been devoted to discussions concerning the best means of overcoming the



The standard 60 B.H.P. "Caterpillar."

transport difficulties with which many centres in the Tropics are confronted, to the extent of keeping them back generally and often putting the planters to serious and needless loss of time and money through the goods deteriorating whilst being kept waiting, or by causing them to miss a favourable market through being held up owing to the congested state of the railway or other system over which they have to pass to reach the coast.

To try and help in the matter we have published several articles showing how a Bullivant cable-way, or a Dolberg light railway can often be used with advantage and economy, or, where the roads allow, how motor traction can also be utilized with benefit to the estates. The question of the roads, however, is a serious stumbling-block in far too many cases, for although transport over them is fairly easy during certain months, they get either excessively dusty or broken up in the dry season, or else become muddy and impassable when the rainy season is on and the roads are soft and spongy, if not actually under water. To overcome this trouble M. Jules Schnerb has introduced the Holt "Caterpillar" tractor to the notice of planters, government authorities, estate and transport overseers, as well as to European shippers to the Tropics generally, especially for use on bad roads, the state of which tends to isolate some estates and even entire districts owing to the difficulty of hauling loads over them except during relatively few months of the year. To overcome such drawback the "Caterpillar" tractor, for which M. Jules Schnerb is the European export agent, was introduced as, being provided with a wide wheel surface, it always covers a considerable area of ground, and is thus independent of the unevenness of bad roads, of holes in broken-up and loose ones, or of the yielding sponginess of swampy, soppy spaces over which the load has to travel. For this reason it is invaluable for East and Equatorial Africa, where the tsetse-fly renders cattle haulage practically impossible. The peculiar build of the "Caterpillar," to which it owes its name,

enables it to move, or rather to crawl, along anywhere and everywhere, and to make steady progress over surfaces in which animals would flounder and vehicles get stuck. The ability to do this is due to the peculiar arrangement covering the main wheels whereby, according to the width of the tracts, some 2,500 to 4,000 square inches of ground are covered by the machine, which not only secures for it a tremendous "grip" of the ground and prevents any chance of slipping, but also does away with any possibility of the tractor sinking into the land. This attachment also enables the tractor to cross a ditch up to even 3 ft. wide, and to see it do so reminds one of a huge elephant in the way it brings down its front wheel like the elephant's foot, on the opposite side of the trench. The front wheel first hangs over the ditch and is then pushed forward across it, whilst following up in the rear the caterpillar attachment spans the cutting which it then safely crosses with the help of the front wheel now firmly resting on *terra firma* a few feet ahead. Such a machine, although weighing nearly nine tons, is said to move smoothly over the ground, leaving hardly any trace behind, whilst it is equally suitable for transporting goods, ploughing, stump extraction, hauling timber, rocks, &c., when clear-



"Caterpillar" climbing out of a bog on a 66 % sandy gradient.

ing the land, as well as for supplying power for saw-mills, threshing, maize-hullers, baling, &c.

SPEAKING at the South African Dinner on May 19th, Sir Owen Philipps, M.P., Chairman of the Royal Mail Steam Packet Co. and of Elder Dempster and Co., Ltd., stated that he believed in the case of Rhodesia, as of South Africa, the future lay in agriculture. The demand for meat was going to be very much greater than the Argentine could supply, and the people of Europe would be bound to turn to Africa to supply their great demand. He believed that the great future of Rhodesia lay in that direction.

ENGLISH beer, says the *Malay Mail*, is displacing whisky in the vogue of the London man. A similar change in fashion might be observed even in the F.M.S., where beer is now more generally drunk at meals than it used to be. But the fashionable tiffin drink at the Selangor Club is barley-water!

The Rubber Exhibition.

AMONGST those who will be exhibiting at the Rubber, Fibres and Tropical Exhibition at the Agricultural Hall will be Messrs. Wm. McKinnon and Co., Ltd., of Spring Garden Iron Works, Aberdeen, exhibit No. 163, who will show plantation machinery for coffee, cocoa, sugar, rice and rubber, some of their well-known coffee pulpers, peelers and polishers, hullers, &c., &c., which they have been supplying to the planters through London merchants and under their name for over fifty years. Their new design of pulper, "The Bonaccord," has many advantages over the old style of cylinder pulpers, the breast being self-adjusting to the cylinder, thus doing away with the old method of adjusting screws, which were such a source of annoyance in the past in setting the breast in line with the cylinder. This pulper is also fitted with McKinnon's patent adjustable breast, "La Perfecta," by which, by an automatic arrangement, all the doors are adjusted simultaneously or together to suit the sizes of the coffee being pulped.

They will also exhibit their latest improved patent Okrassa Coffee Peeler and Polisher, which is giving great satisfaction and is by far the most perfect peeler and polisher on the market. It requires much less power than the old system of Smout's Peelers, and besides doing much better work it does not heat the coffee. Their other exhibits will be steam engines, pelton wheels, rice hullers, &c., all of which are specialities of the firm.

THE TYNESIDE FOUNDRY AND ENGINEERING Co., of Elswick, Newcastle-on-Tyne, are exhibiting their well-known Dryers for Tropical Products.

On this Company's Stand, No. 169, in King George's Hall, will be found one of their Hot-air Chamber Dryers for rubber, cacao, &c., also the "Chula" Air-heater. This Air-heater is specially designed for such fuel as coco-nut husks, shells, firewood, &c., and when required is specially fitted to burn charcoal. A liquid fuel attachment is also shown.

Those who are more interested in rubber may inspect Agar's patent Latex Smoker and Coagulator, specially made by this firm for their Ceylon agents, The Talawakelle Engineering Works, Ltd.

The "Chula" Copra Dryers, owing to their size, are not exhibited on the Stand, but the smallest size made ($\frac{1}{2}$ ton of copra per day) is shown at work in the outside yard exhibit, where demonstrations will be given daily.

On the Stand, however, photographs of the various sizes of Copra Dryers can be inspected, as well as samples of "Chula" dried copra.

AN exhibit which we shall carefully study will be that of the Kalisyndikat, the representatives of the German Potash Mines, sole producers of Potash Salts and Manures, as we understand that those in charge intend to demonstrate the effects of using potash in fertilizers and manure mixtures on the most important tropical and sub-tropical crops, illustrated with photographs and figures giving results of numerous experiments.

From Australia will be shown apples and samples of wine from differently manured plots of an experimental area, whilst from the Caroline Islands, the West Indies, and Ceylon will be samples of coco-nuts. Rubber samples showing the product in its crude state and in its refined state, as obtained from plots which had been dressed with various mixtures, are being sent from the German colonies in East Africa, while rubber trees showing the effect of manuring will be forthcoming from Ceylon. Those attending our paper on the manuring of rubber will be interested in this section. The West Indies are also sending growing "stools" of sugar-cane illustrating the degrees of growth on an "unmanured" plot, a "no potash" plot, and a "complete manure" plot. India, of course, will send samples of tea, and the United States samples of cotton, and in every case numerous photographs illustrating the results of manurial experiments on the various crops will be exhibited.

In connection with the Tropical Exhibition, the Potash Syndicate, as stated in the article we published last October, illustrating the trophies, has offered two handsome silver trophies for the best and second best samples of cotton grown with the aid of a complete fertilizer containing potash.

Planters and others interested in the manuring of crops in the Tropics will be especially welcomed at this Stand, and advice on the subject of manuring will gladly be given by the officials present.

Details of the stands taken by Messrs. Hollings and Guest, Ltd., Wm. Weeks and Son, Ltd., Summer-scales, Ltd., and Venesta, Ltd., were included in our May issue advert., p. xxxvii.

"TO-DAY we have almost entirely to depend on foreign rice for our estate population," writes a correspondent in the *Ceylon Observer*, "and the high price of rice is opening the eyes of many. Even in villages—not to speak of towns where the people depend entirely on it—coast rice is consumed largely and the question of improvement of our paddy cultivation must receive the earnest attention of the Department of Agriculture. Government should treat it as of utmost importance. It is estimated that there are about 650,000 acres of paddy land under cultivation. At the least this extent, if annually cultivated, ought to give a return of 13,000,000 bushels of paddy (or a little over 6,500,000 bushels of rice), taking 20 bushels per acre as a fair average all round the island. It is now an undisputed fact that an acre of paddy land, if properly cultivated, will give twice as much, *i.e.*, we will have more than 13,000,000 bushels of rice instead of paddy; and provided half this is cultivated with a second crop, and taking 15 bushels as a fair average, our supply of paddy will be increased by 9,750,000 bushels. To put it shortly, if the Department of Agriculture will make an endeavour to improve our paddy cultivation, we can annually put out 35,750,000 bushels of paddy with our present area of paddy lands and three times as much, or much over a hundred millions, if steam ploughs are proved a success and if Government will assist by disposing of the miles and miles of abundant paddy lands on easy terms."



Photo by Elliott and Fry, Ltd.]

"Tropical Life" Friend.—No. 108.

DR. HENRY ALFRED ALFORD NICHOLLS, C.M.G.

Author of "*A Text-book of Tropical Agriculture*," &c.

MODEST to a degree "Our Friend" this month, if he could be induced to do so, which would be impossible, can well own to being pleased with himself and with the important part he has played during the past forty years in his own sphere; for we believe Dr. Nicholls has established a record in remaining (in Dominica) in the full Tropics for that period without coming home. His case is especially striking for the splendid advertisement he offers of how the right man leading the right life can benefit and not deteriorate in health by a long spell in the Tropics, although leading a busier and more strenuous life, both mentally and physically, than falls to the lot of most of us even in temperate climes. Bald heads are met with by the score on this side even with men at 30 to 40; it remains for the Tropics apparently to produce a man whose hair seems to grow more luxuriantly year by year instead of becoming thinner until it approaches the vanishing-point, as is so often the case over here, as we personally are only too well aware of.

Apart from medical science, in which he has gained a reputation, to those outside Dominica Dr. Nicholls is best known for his inimitable book on Tropical Agriculture, which, published long ago (in 1890), when such books were few and far between, has indeed proved a "friend in need and a friend indeed" to those fortunate enough to become acquainted with it. Even to-day it is one of five or six books that we always keep in front of us to refer to, and are constantly making use of although our bookshelves now almost encircle the editorial sanctum. On this account we had much pleasure in accepting the kind invitation of the Editor of the *West India Committee Circular* to attend the dinner given by the West India

Club in honour of "Our Friend," when we were glad to hear from him that TROPICAL LIFE is well known throughout the West Indies, and is doing excellent work out there.

The letters which should follow Dr. Nicholls's name are too many for us to enumerate. Besides those at the head of these notes, "Our Friend" can claim M.B. (Honours) 1873, M.D. 1875, M.R.C.S.Eng., F.L.S., &c. He is also a corresponding member of the Zoological Society, of the New York Academy of Science, the Jamaica Institute, Central Agricultural Board of Trinidad and other institutions, as well as being an honorary member of the Royal Agricultural Society of British Guiana, the Agricultural Society of Trinidad, and other bodies. *Chez-lui* in Dominica, Dr. Nicholls, who was born in London in 1851, is President of the Agricultural and Commercial Society, Chairman of the Permanent Exhibition Committee, he was Crown Nominee in the old Legislative Assembly, 1875-77, and is one of the original members of the Legislative Council, Senior Medical Officer, and the leading spirit in other institutions that are doing good work in the island, as Dominica for many years past has been very up to date and very English in the way it looks after the sick and needy, an example that some other tropical centres would do well to study and follow.

If we remember rightly, although it is a good time ago now, Dr. Nicholls was Local Commissioner for Dominica in connection with the Colinderies (Colonial and Indian Exhibition) of 1886, one of the most interesting and instructive exhibitions we have had to do with. It was soon after, among his other duties, as Curator at the Botanic Station, Dominica (May to October, 1890), that "Our Friend" completed the MS. that gained him the £100 prize offered by the Government of Jamaica for the best text-book on tropical agriculture.

The years 1890 to 1904 were busy ones for Dr. Nicholls in matters medical, municipal and agricultural, especially 1891, which found him a Special Commissioner to inquire into the prevalence of yaws in the West Indies. We were in the West Indies at the time, and can well remember the attention and discussions that were devoted by medical men and laymen alike to this disease; the report was published as a Blue Book, and "Our Friend" received the thanks of the Secretary of State for his valuable help in connection with the matter. In 1899, in 1901, and again in 1902, Dr. Nicholls represented the Leeward Islands at the various West Indian Agricultural Conferences held in Barbados in those years, whilst in 1905 he was in Trinidad attending the West Indian Agricultural Conference. In 1911, when Chairman of the Coronation Celebrations Committee, he acted as President of the Legislative Council, Dominica. Besides the "Text-book on Tropical Agriculture," Dr. Nicholls is the author of "Dominica Illustrated and Described," as well as of many pamphlets, articles, reports, &c., on medical, botanical, agricultural, natural history, and other subjects. We do not exaggerate, therefore, when we claim that "Our Friend" has played a busy, useful and important part in building up the fortunes of our Empire in that portion of its vast area that has had the good fortune to have him in its midst for so long.

Best of all, the doctor looks younger and is as vigorous as ever, and can look forward to as long and useful a spell ahead as he has to his credit when looking backwards.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JUNE, 1914.

The Royal Botanic Society and the Advancement of Economic Botany.

IN our leading article last month we expressed regret that the British Public through their Government had not taken steps (by voting a very small sum of money, comparatively speaking, to establish agricultural colleges in the Tropics) to safeguard the continued supplies of raw material and foodstuffs imported into this country, without which trade and living generally would come to a standstill.

This month we have to call attention to another chance to benefit and extend commercial and agricultural pursuits in the Tropics and sub-Tropics that has been allowed to slip by, when the vacant secretaryship of the Royal Botanic Society, which boasts a royal charter and enjoys all the privileges that such a charter confers, has been bestowed on the secretary (of nineteen years' standing) of the Alhambra Music Hall, Leicester Square,* and not on a botanist of scientific or practical knowledge, who could have turned the Gardens to economic uses, and not merely used them as a convenient centre for society functions, or to learn golf. We are in great need of such an opportunity as the Gardens offer, situated as they are in the heart of London, of stimulating and extending the knowledge and practice of economic botany in every way possible, not in any wise in competition with Kew or the Royal Horticultural Society, but as an auxiliary to the work

they are doing, and which at present has to go undone for the want of a suitable site in London.

We cannot help feeling that were the Council of the Botanic Society kept up to the number specified in the charter, viz., thirty-two, exclusive of the President and Treasurer, instead of thirteen as at present, and the Vice-Presidents stood at ten, instead of only two, a competitive policy would have been brought up whereby the terms of the charter could have been fulfilled, as pointed out in the *Times* of June 12th, when criticizing the Society's non-compliance with these terms. "The first object of the Society," the *Times* tells us, "according to the terms of its charter, is the promotion of botany in all its branches and its application to medicine, arts, and manufactures. The simple fact is that the advancement of economic botany has sunk to a place of minor importance in the policy of the existing Council, and the Society has sought to buttress its financial position by casual receipts from garden parties, dog shows, and London society entertainments."

How the Society's finances stand to-day the Fellows themselves seem unable to show, for on applying to one for information on this point, all he had to show was an abbreviated account of the income and expenditure, and none of the recent reports seem to include the assets and liabilities of the Society and how the former are invested; yet one of the rules and by-laws particularly stipulates that a report of the general state of the funds shall be printed and distributed among the Fellows.

From the point of view of economic botany, therefore, the future of the Botanic Society and their Gardens seems in a bad way; but must this be? Cannot the charter be revoked if its terms are not carried out? The possibilities of the Society as a centre of learning and demonstration are so immense that we should greatly deplore so drastic a step being taken, as the Gardens and the work they *could* and *should* do are an absolute necessity at the present time, and will be even more so when we get our agricultural colleges in the Tropics. What the Imperial Institute is doing with the finished product, that is, samples of the various crops, and Kew has been doing for years on scientific lines when introducing and transferring plants of economic value from one centre to another, the Gardens and glasshouses at Regent's Park can add to by securing samples or specimens of parcels of plants or seeds passing through London as part of a commercial shipment (say from Manchuria to West Africa or Malaya to British Guiana), and planting these to show busy Londoners at the cost of a few pence, and, at most, an hour's time, what plants are being used, how they stand the journey, what they look like, how packed, &c. By such means and in a hundred other ways the Gardens at Regent's Park could be of immense value in pushing on the trade and commerce of this country, and in doing so help Kew in a way that that most useful institution cannot at present help itself.

Realizing this, we long ago offered to do all we could to work with the Royal Botanic Society if they would develop the side devoted to economic botany, but no notice was taken of the offer. When the secretaryship of the Society fell vacant the other day we succeeded,

* The criticisms of one of the Fellows on such an appointment when writing to a friend at Kew were decidedly amusing; he evidently had not realized before the advantages Leicester Square must possess for learning botany.

after much difficulty, in persuading a most excellent candidate for the work, an ex-Director of Agriculture, an F.L.S., and author of several books, to apply for the post, and when his application was passed over under some frivolous pretext, our Editor himself sent in an application, which was likewise refused, and the Leicester Square man got the post. We feel that the study and advancement of economic botany will now occupy a very back place, unless the remarks that we are making, and the *Times*, *Star*, and probably other papers have made, or will make on the matter, either cause the Council to add to their numbers and mend their ways, or the Crown to revoke the charter. We sincerely hope it will be the former.

The Shipment of Coco-nut Oil in Bulk.

As we foreshadowed early in 1912, in the first as well as the second edition of our "Coco-nut" book, p. 358, where we say: "The question of freight and a stray chance of the vegetable-oil producer following the lead of the petroleum shippers, and shipping his oil in tank steamers, may yet cause oil and not copra to be the main article of export, especially from the Philippines," the increased use, and especially the increased requirements, of the factories for copra and other oils is turning consumers' attention to expressing the oil on the spot, at the producing centre, and shipping it in tank vessels, and seems likely to become *un fait accompli* before long, not only to save the freight, but because the cost of expressing the oil will be considerably lower at the centre of production. This is what the *Indian Trade Journal* has to say on the matter (see their issue of April 2nd, p. 7):—

"The increased use of copra for oil production which has been witnessed in the last few years, and has led to the development of copra exports and the planting of an immense acreage of coco-nut groves all over the Far East and in southern islands, is leading to the establishment of oil factories* at various points in the coco-nut-growing districts. According to the American Consul-General at Hongkong, a new concern of this sort has been in operation at Manila for some time. An enterprise is now on foot to establish a much larger undertaking of the sort farther south in the Philippines, nearer the centre of Philippine copra production. There is also in hand an undertaking of this sort in the Malay States. These concerns are put forward by responsible interests, and it is evident that the business of extracting oil from coco-nuts in the Far East and shipping it to Europe or the United States is tending to supplant that of shipping copra to Europe and the United States for the extraction of oil there. Extracting the oil near the point of production of the copra means a saving in transportation costs, and an improvement in the quality of the output. Freight charges on copra to the United States or Europe are high because of the bulk of the cargo, and also because of its usual offensiveness; moreover, the losses *en route* amount to about 16 per cent. of the copra. The copra also usually arrives at Marseilles or New York in such a state that it is unfit for use in food products except after expensive refining. By expressing the oil in the Philippines, for example, there will be a saving in freight owing to the reduced bulk, and also a saving because of the fact

that oil can be shipped in ballast tanks and between the double bottoms of vessels, and can be pumped into and out of vessels, thus reducing handling charges to a minimum. Pressing oil from the copra before it has become rancid or mouldy also greatly improves the quality of the output. The Manila factory handles 65 tons of copra per day of twenty-four hours. The concern now being organized for operation in the southern portion of the islands will handle about 130 tons of copra per day. Present methods of extraction in the Philippines appear to be of the most advanced sort. About 92 per cent. of the oil—usually running about 63 per cent. of the copra—is extracted without difficulty, at a cost considerably below that obtaining in Europe."

The above, as described, is perfectly practicable and possible; what the shipper has to remember is that vegetable oils, which in the Tropics remain liquid and can easily be pumped into the tanks, become denser and more solid as they approach the temperate zone, until when the time comes to unload the cargo it is no longer liquid, but solid, especially if, as can quite well happen, a temperature below freezing point prevails at the unloading port at the time of the vessel's arrival. To overcome this—which, we take it, would be no trouble but an advantage on the voyage, since a solid cargo is less dangerous than a liquid one to carry—steam coils could be and probably would be introduced into the ship's tanks, and by means of these the oil would be heated and liquefied sufficiently to be pumped out. As to what heat would be necessary, must depend entirely on the length of piping through which the oil has to pass, and the temperature outside, for if the thermometer was below freezing-point then the oil would require to be sufficiently warmed to keep it liquid until it reached the storage tank ashore, or the transport receptacle waiting to move it inland. We leave it to experts to say the temperature required; it would have to be above 90° F., and if carefully purified oil as for human consumption is being handled it might even go as high as 280 to 300° F., we believe, without fear of harming the oil; but as a rule 120 to 150° F. should be sufficient, unless the piping extends a considerable distance and the weather was unusually cold.

Oil Palms—Who Will?

THE CRY OF THOSE WISHING TO SEE THE OIL-PALM CULTIVATED ON LINES SIMILAR TO COCO-NUTS, CACAO, RUBBER, &c.

"THE advanced prices of palm kernels would naturally have led us to look for greatly increased supplies, as instanced in rubber," urge Messrs. Bigland, Sons and Jeffreys, of Liverpool, "but so far indolence of native labour,* and time to establish estate production, have prevented the output from keeping pace with the demand." Consumers, therefore, must and will continue to study every scientific process possible to enable them to substitute lower-priced oils for those that are too high to pay them to work, since the retail buyer cannot or will not pay above a certain price. Force him to do so and he curtails his purchases,

* Also, of course, of soap factories, as at Shanghai.—ED. T.L.

* Also, and perhaps rather, on account of their ability to earn more money at other work, especially cacao planting.

even to the extent of going without, as big concerns have done with copper and tin in company with the poorest man, woman and child in connection with their supply of tobacco, tea and soap. For these reasons this country cannot and must not allow the oil-palm plantation industry to be neglected, otherwise, the same as with the soya bean and oil industry in this country (see the May issue, p. 94), we shall lose the chance of developing important new industries just when our enormously increased taxation renders it important that new industries should be started and established, or developed and extended, and we shall lose the chance for a reason that should not exist, *i.e.*, on account of the lack of adequate regular supplies of the raw material. With the soya oil trade the loss of a promising business has been regrettable enough, but should our supplies of palm oil and palm-kernel oil take to falling short, then the consequences will be most serious, not only on account of the loss of trade and revenue that would ensue, but also on account of the serious discouragement to cleanly ways and hygienic ideas that dear soap would spread among the lower classes, which it is necessary at all costs to keep up to the present day's standard of cleanliness—a standard that has cost so much trouble, time, patience, and money to establish, and which we hope will further advance, and not go back.

As we cannot help feeling at times that far more individual capitalists would turn their attention to the cultivation of oil-palms were they more fully aware of the soundness and security that a well-managed oil-palm estate offers to its owner, provided that he (1) secures the right soil; (2) the right variety of oil-palm, and (3) that he does not pay too high for the land, we think it would not be amiss to give a few details concerning the industry. As we acknowledge the sources whence we draw the information* those who wish for fuller details can study the works mentioned, or even write to the authors for any information required.

"Owing to its extensive and peculiar root development," we understand from Mr. Beckwith, "the oil-palm will grow under the most unfavourable conditions of soil and moisture, though not with any great amount of success. It does not, however, succeed where the rainfall is below 50 in. per annum, nor in swamps, nor on poor soils. To obtain the best results it requires a heavy, well-distributed rainfall of from 70 to 100 in. per annum, and a moist fairly equable climate with a deep holding soil; these conditions are found in the deep alluvial humus-covered soils of the forest regions of West Africa and along the coast inward for a distance of from 70 to 150 miles. It does not grow at high elevations; on the Cameron mountains, for instance, it disappears after a height of 3,000 ft. above sea level." Mr. Milligan, in his book, gives very full particulars of the root development of these palms, and the soil which induces them to give the best results.

On pp. 34-36 of Messrs. Billows and Beckwith's book we are told that, according to Farquhar, an aver-

age cone of palm fruit weighs 31 lb.; the fruit alone weighs 20 lb.; the stalk refuse weighs 11 lb.; average number of fruit per cone or bunch, 1,600; average number of bunches per palm (S. Nigeria), 5; but it is common to find trees yielding many more, even eleven having been seen on one palm at the same time.

Again quoting Mr. Milligan, we are told: "By the time it has reached its tenth year of growth the oil-palm is fully matured and will bear up to twelve régimes or bunches per year. Indeed, there have been well authenticated cases where a *cultivated* palm has yielded as many as twenty régimes within the twelve-month." Against this Mr. Billows gives the following figures, based on his personal experience: An average cone of fruit weighs 23 lb.; the fruit alone weighs 16 lb. the stalk refuse weighs 7 lb.; average cones or bunches per palm, per year, 3; average density of bearing palms, per acre, 50.

On the basis of Mr. Billows' figures, an acre of land, therefore, should give 2,400 lb. of palm fruit per annum, say, 50 palms* by 3 bunches each, 16 lb. net of fruit. Then, turning to the composition of the fruit, we are told that, on an average, it contains:—

Pericarp oil	...	18	per cent.
Fibre and moisture	12	„	
Shell and dirt	...	58	„
Kernel	...	12	„ = Whole fruit 100 per cent.

On Mr. Billows' figures, therefore, 2,400 lb. of palm fruit with a total percentage of 18 per cent. pericarp oil, or, say, a commercial yield of $16\frac{3}{4}$ per cent., should give 402 lb. palm oil (1 gall. = 8.2 lb.), and 1,000 tons of palm oil should cost (as per table given on p. 36) £14,770 to produce, less 4,200 tons of palm nuts resold to the natives at 10s. per ton = £2,100, plus £3,000, say, £3 a ton, to cover English staff expenses, office rent, directors' fees, &c., gives £15,670 actual cost, equal to £15,134, of fine, soft palm oil, delivered Liverpool.

(To be continued.)

The Yucatan Sisal Output.

THE carefully worked out suggestion made by Mr. Alfred Chatterton, C.I.E., Director of Industries, State of Mysore,† that "there is probably a million acres of unoccupied land in this Province more or less suitable for aloe or sisal cultivation" causes one to look up statistics regarding the outputs from Mexico and to consider what chance such a large area as the one mentioned would have if brought into direct competition with that old-established industry of the Indian and half-Indian population of Yucatan; an industry, too, that is run on lines that, even if it is not actual slavery, could never be allowed in Mysore. According to the *Boletín de Estadística*, the official organ of the *Hacendados Henequeneros*, of Yucatan, last year was a record one as regards the total exports of sisal, which were:—

* Mr. Milligan speaks of 80 palms, but we should say that, considering the size to which the leaves extend, 40 palms to the acre would give the best results of all in the end.

† The *Indian Trade Journal*, of Calcutta, of April 2nd, 1914, devotes two columns and a half to a discussion of Mr. Chatterton's idea.

* "Palm Oil and Palm Kernels." By Billows and Beckwith. Price 1s. net. Charles Birchall, Ltd., 17, James Street, Liverpool. "Le Palmier à Huile." By Paul Hubert. Price 7s. 6d. post free. TROPICAL LIFE Publishing Department. "The Cultivation of the Oil-palm," by F. M. Milligan, F.R.G.S. Price 2s. 6d. net. Crosby, Lockwood and Son, Ludgate Hill, E.C.

		Bales	Tons (1,000 kos.)
Jan. 1st.—Dec. 31st, 1913	...	836,950	... 145,280
„ „ 1912	...	814,610	... 139,902
„ „ 1911	...	680,990	... 116,547
„ „ 1910	...	558,996	... 94,789
„ „ 1909	...	567,427	... 95,756

Of this output 520,143 bales were exported during the second half of 1913, against 491,841 bales in 1912. As the total weight of the 1913 shipment was 90,658,183 kos., the average weight was 175 kos., or about 350 lb. Of the 520,000, one firm, that of Avelino Montes, exported 406,728 bales (71,466,000 kos.), Arturo Pierce coming in as a poor second with 86,741 bales (14,609,887 kos.), and the Cia de Hac. Henequeneros was third with 18,817 bales (= 3,244,867 kos.). The average value of the sisal shipped during the last six months of 1913 was 28.145 cts. (100 cts. = \$1 = 2s.) per kilo., against 20.882 cts. in 1912, so that the price was 7.263 cts. better per kilo. (2.204 lb.). The value of the 520,000 bales (July-December shipments) was \$25,516,500, equal to £2,516,000.

Were India, therefore, to plant up even 100,000 acres with sisal, and that area gave a fair yield, it would be interesting to see how far the Indian output could affect the Yucatan planters, and how the combined outputs would affect prices. We fear they would be pulled down below the limit of profit-yielding, as many centres to-day dabble in sisal and some have a fair output, but no one outside Yucatan seems to be growing rich out of the industry, and many seem extremely loth to have anything to do with the fibre.

The Cost of Making Copra.

SOME ACTUAL RETURNS FROM CEYLON.

THOSE interested in coco-nut culture who wish for actual facts as regards returns should study the report of the Chilaw Coco-nut Co., of Ceylon, for the year ending December 31st, 1913, especially as the estate is old-established, consisting of two estates (Walahapitiya and Letchmey) with a total acreage of 1,100 acres, made up as follows:—

200½ acres	...	...	29 to 34 years old
400½ "	...	...	22 " 23 "
43 "	...	...	20 " 22 "
50 "	...	...	19 " 22 "
100 "	...	...	15 " 19 "
100 "	...	...	14 " 18 "
84 "	...	...	9 " 14 "
50 "	...	...	8 " 13 "
56 "	...	...	7 " 10 "
11 "	...	...	Jungle
5 "	...	...	Paddy

Unfortunately we are not told how many trees go to the acre, or what the total number is.

From this area they secured 2,252,334 nuts (thanks to plentiful rains in 1912), whereas last year in August and September, supplies of rain were short, so that during these same months this year (1914) a shortage is expected, otherwise, it seems, the output is well ahead (385,000 nuts) of last year so far, against 1,774,964 nuts in 1912. Of last year's output 37,492 nuts, or 1.66 per cent., were rejected (what actually became of these is not stated) and 7,436 were sold as seed-nuts. The balance (2,207,406 nuts) produced 2,008 candies (at 560 lb., or ¼ ton, to candy = 500 tons). The chairman called attention to the fact that it took only

1,099 nuts to the candy (4,396 to the ton), against 1,254 nuts in 1912 (5,016 to the ton), which reduction in the number required is put down to the good rainfall in 1912 giving weightier nuts last year. All this reminds us of our troubles, when writing our book on "Coco-nuts," to find out exactly how long it takes between the time that the trees first flower and when the nuts are ready for picking, a point we are fortunately able to fully discuss in the second edition (pp. 590-593), where, as shown by the Chilaw Report, it should take about twelve to thirteen months. Now, the 2,008 candies cost Rs. 24.02 to produce (say, 128s. per ton), including Rs. 12.04 (64s. per ton), or just half, for manuring. If these figures are correct the proportionate cost of manuring is high, £1,600 for 1,100 acres or, say, 30s. an acre (the cost of picking, drying copra, &c., the same), but at the same time it pays and pays well, since that which cost Rs. 24 to produce, including the Rs. 12 for manuring, sold at an average price of Rs. 96.47, or four times the price, and although values are now lower, a forward contract was made for the sale of 2,000 candies during 1914 at Rs. 95 per candy for No. 1 copra. Meanwhile those who shirk adequate cultivation and manuring should note that this estate, through the chairman, prides itself on the fact that its lands are clean, and that a careful system of husbandry has been pursued throughout this, and last year, and as a result the palms are in an excellent and healthy condition, and the output this year, so far, is ahead of 1913.

Here, then, we have three important facts, viz.: It costs in Ceylon on a well-managed estate Rs. 24 a candy, or 128s. a ton, to produce copra, of which expense half is incurred in manuring the palms, and that the copra realized an average price during 1913 of Rs. 96 per candy, or £25 12s. a ton in Ceylon. That after a good year of rain 4,396 nuts are sufficient to make a ton of copra, whilst a less heavy year can increase the number required by 15 per cent.; such details are worth noting, since we are told an ounce of fact is worth a pound of theory.

Economic Zoology.

Our Motto, "Utilization not Extermination."

It had been found, Sir Ernest Shackleton told those who entertained him to dinner as a member of the Pilgrims' Club, on April 24th, that a dense ice season in the Weddel Sea meant heavy rains in Chili and the Argentine. Argentine and Chili did not belong to this country, but science knew no country. It appeared that there was an open season in the Weddel Sea this year, with the result that the rains were not so heavy in the Argentine. If they could get observations over a series of years in the South Polar regions, the farmers and stockbreeders of the Argentine would be more or less able to regulate the water supplies and various other problems that they had to contend with. If, therefore, the Antarctic affects the South American Continent in this way, could it not also affect Australia and New Zealand with their sheep farms as well, and could not they also foretell a little what was going to happen in the way of rainfall, if they knew what sort of season prevailed down south?

Soya Beans.

ACCORDING to the *Indian Planters' Gazette*, interest in the commercial possibilities of the soya bean in India has been stimulated by the reports of Mr. E. J. Woodhouse and Mr. Taylor, of the Agricultural Research Institute, Pusa. In a note in the October number of the *Agricultural Journal*, Mr. Woodhouse says that the best beans ever put on the English market were those from South Russia; and the Nepal variety, as grown in the Himalayas, weighs distinctly heavier than the Russian, though the latter has a very slightly larger oil-content, 19 per cent., as compared with 18.5 per cent. The disadvantage of the Nepal bean is its brown colour, which may affect the value of the meal made from it, as for commercial purposes a pale yellow colour is considered best. An analysis is given of the two varieties, and it is stated that "the figures prove that India is capable of producing as good a quality of soya bean as can be produced anywhere else, but it cannot be expected that the seed will fetch its full market value unless arrangements are made for growing and marketing large quantities of the beans in favourable localities." Regarding the oil content of the bean, we see by the *Mindanao Herald* that whereas in its home country of Manchuria the oil content is only about 15 or 16 per cent., some of the new varieties which have been bred up in America and Europe run as high as 20 and even 22 per cent. South Africa is now taking up this crop and it is found that the altitude somewhat affects the yield of oil in any given variety; for instance, at an altitude of 1,000 metres the yield of a certain variety is about 20 per cent., while at sea level it is about 22 per cent. Germany, ranking with France as the heaviest importer of oil seeds, has been trying for years to find a suitable oil crop which could be put under intensive cultivation; this desire seems about to be realized in the shape of soya, many varieties of which can now most likely be grown in Germany with excellent success.

In our last April issue we devoted the leading article to urging our readers to increase the area under this useful and remunerative crop, as the demand is so far ahead of the supplies, our own centre (Hull) being an especial sufferer, and work having to be stopped through inability to secure the necessary raw material. This article was written nearly a year ago, and what we then said is confirmed by the Special Correspondent of the *London Chamber of Commerce Journal* in the annual report published by our contemporary. Generally speaking, we are told, the crushing trade for 1913, thanks to an adequate supply of raw material, has done much better than in 1912, supplies of linseed constitute a record, and imports of cotton seed have been ample; but soya beans have been short, and the trade unprofitable, although, taken as a whole, the year has resulted in a fair trade. As regards prices, it is curious to note that whilst linseed oil varied between 39s. and 21s., cotton oil, on the other hand, which started at 25s., has been up to 38s., although at the close it was very much lower. Imports to the beginning of December stood as follows, and show the serious decline in the imports of soya beans:—

		1912.	1913.
Linseed	... ..	517,285	1,534,739 qrs.
Rape seed	... ..	92,102	134,331 "
Castor seed	... ..	209,621	258,403 "
Totals	... ..	819,008	1,927,473 qrs.
Cotton seed, Egyptian	... ..	154,077	126,350 tons
„ others	... ..	104,076	138,300 "
Totals	... ..	258,153	264,650 tons
Soya beans (imports)	... ..	134,801	63,046 tons
„ oil (exports)	... ..	13,256	6,255 "

According to the report of the Agricultural Department, Assam, Manchurian soya beans were tried on a small scale at Jorhat with great success, the yield being over 18 maunds per acre. Other crops tried at Jorhat were ground nuts and potatoes, the former produced a fair crop, but much of the produce was eaten by rats in the field; potatoes gave a poor yield.

MEETING Mr. John Gordon, of Messrs. John Gordon and Co., the engineers, of 9, New Broad Street, London, E.C., we were asking him news of a reported improved demand for coffee machinery throughout Brazil, and we agreed that machinery for drying the coffee as well as for husking and cleaning it, could be used with great advantage and economy to the fazenda owners compared to the present methods. On pointing out the enormous output of some estates, not only in Brazil, but at other centres, Mr. Gordon remarked that hulling machines have to be used as it is, and that the leading company-owned concern have a large number of his machines in use, that they give every satisfaction, and the coffee, as can be seen in any report of the company's meetings, always sells several shillings above the average of the coffee exported from Santos. As far as this important producing area is concerned, therefore, Mr. Gordon insists that if Santos wants to raise the level of quality in its coffee, they can at once do so by importing more up-to-date (and yet not costly) machinery than most of the estates at present have in use. There has been a great extension, of course, in coffee production in the East (Java, Sumatra, &c.) and also in British East Africa. In the last-named centre two central coffee-cleaning factories are now being reckoned capable of treating forty-five tons of coffee per day, and it is his (Mr. Gordon's) firm who are supplying the whole of the machinery and apparatus.

THOSE interested in, and especially those wishing to purchase, mosquito-proof gauze or door or window screens, should apply to our old friends, Messrs. George Christie, Ltd., of Govan, Glasgow, for their illustrated pamphlet entitled "Shut Out," in which the question of mosquitoes, their bite and its results, is fully discussed, together with modern systems of screening houses, doors, ship port-holes, &c., with Christie's oxydized phosphor-bronze mosquito gauze. In this brochure the work of the schools of the Tropical Medicine is discussed, the life history of the pest illustrated, and photographs of a steamer and mosquito-proof buildings in the Tropics are also included. If the bite of a mosquito is as much to be dreaded as that of a mad dog, Messrs. Christie have the necessary muzzle by means of which no biting, and hence no infection, can take place.

Cotton.

THE following were the prices for Cotton in London on June 12th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1913.		Compare Good, 1912.	
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	per lb.
Surat kinds *	5 $\frac{1}{8}$	5 $\frac{3}{8}$	5 $\frac{5}{8}$	6	5 $\frac{9}{16}$	6 $\frac{5}{16}$	—	5 $\frac{3}{4}$	5 $\frac{1}{2}$	5 $\frac{5}{8}$	—
Madras ...	—	5 $\frac{7}{8}$	5 $\frac{3}{8}$	6 $\frac{1}{4}$	—	—	—	5 $\frac{5}{16}$	6 $\frac{1}{4}$	5 $\frac{1}{16}$	—
Bengal ...	—	—	5 $\frac{1}{8}$	—	4 $\frac{5}{8}$	—	4 $\frac{3}{4}$	5 $\frac{1}{4}$	—	5 $\frac{1}{4}$	—
Assam ...	—	—	5 $\frac{3}{16}$	—	5 $\frac{9}{16}$	—	5 $\frac{1}{16}$	5 $\frac{3}{8}$	—	5 $\frac{5}{8}$	—
China ...	—	—	5 $\frac{1}{2}$	—	5 $\frac{1}{16}$	—	6 $\frac{1}{8}$	5 $\frac{9}{16}$	—	5 $\frac{7}{8}$	—
West Indian ...	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{2}$	—	8 $\frac{3}{4}$	5 $\frac{3}{4}$	—	7 $\frac{3}{4}$	—
Sea Island ...	10 $\frac{1}{2}$	—	13 $\frac{1}{2}$	—	17	—	20	15	—	14	—
West African ...	7 $\frac{3}{16}$	—	7 $\frac{1}{2}$	—	7 $\frac{7}{8}$	—	—	6 $\frac{1}{2}$	—	6 $\frac{9}{16}$	—
East ,, ...	7 $\frac{1}{2}$	—	8 $\frac{3}{8}$	—	10 $\frac{3}{16}$	—	—	7 $\frac{1}{2}$	—	7 $\frac{3}{16}$	—

* Liverpool quotations.

During the past fortnight the holidays have much restricted business. On June 1st the Agricultural Bureau issued its report, giving the average condition up to May 25th as 74.3 per cent., as compared with 79.1 last year. This caused a sharp advance in American Futures, and although it was lost soon afterwards gains have taken place since on continued unfavourable crop accounts. Prices show a rise of about 11 points for near and about 4 for distant. Spot sales have been small, but the quotation for middling has been advanced to 7.87d. East Indian has hardened in sympathy and there has been a good demand, especially for Madras kinds. Values are about $\frac{1}{8}$ d. to $\frac{1}{4}$ d. per lb. higher.

The import into Liverpool this week amounts to 41,937 bales, since September 1st 4,294,085, same week last year 27,142, last year's total 4,304,227 bales. The estimated Sales amount to 21,000 bales, including "called." Middling American is quoted at 7.87d. per lb., last year 6.70d., 1912, 6.60d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight ...	14,121,000	13,459,000	15,451,000	bales
Exports from United States since September 1st—				
To Great Britain ...	3,263,000	3,445,000	4,125,000	—
To Continent, &c. ...	5,208,000	4,698,000	5,994,000	—
Total crop ...	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	June 12th.	Same time 1913.	Same time 1912.	
	d.	d.	d.	per lb.
June ...	7.51 $\frac{1}{2}$	6.52 $\frac{1}{2}$	6.39	—
June—July ...	7.33 $\frac{1}{2}$	6.46 $\frac{1}{2}$	6.38 $\frac{1}{2}$	—
July—August ...	7.33 $\frac{1}{2}$	6.44 $\frac{1}{2}$	6.39	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

Good supplies of all descriptions were submitted at auction this week (ending June 12th) and the market generally has been firm and values fully maintained. "Futures" have ruled easier, chiefly owing to heavy receipts, and September Santos closes at a decline of 10 $\frac{1}{2}$ d. for the week. We quote :—

		To-day	June 4th, 1914
London ...	Santos, Sept. del. ...	44s. 6d. ...	45s. 4 $\frac{1}{2}$ d.
New York ...	No. 7, Rio ,, ...	9.17 cents ...	9.23 cents
Hamburg ...	Santos ,, ...	50 $\frac{3}{4}$ pf. ...	50 $\frac{1}{4}$ pf.
Havre ...	Santos ,, ...	61 $\frac{3}{4}$ francs ...	62 $\frac{1}{4}$ francs

The receipts at Rio and Santos from July 1st, 1913, to June 10th, 1914, were 13,430,000 bags, against 11,091,000 bags and 12,139,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—Mysore, 63s. to 70s. for smalls, 66s. 6d. to 74s. for low middling to middling, 70s. 6d. to 79s. for low middling to good middling. Coorg, 57s. to 67s. for smalls, 65s. to 72s. for medium, 70s. to 76s. for bold. Neilgherry, &c., 70s. 6d. for smalls, 76s. for medium, 82s. for bold. Naidobatum, 66s. to 68s. 6d. for smalls, 71s. to 73s. 6d. for medium, 75s. 6d. to 79s. 6d. for bold. Travancore, 67s. 6d.

for smalls, 71s. to 72s. 6d. for medium, 72s. 6d. to 77s. for bold.

Mocha.—At 85s. for long berry.

Nairobi.—At 65s. 6d. for smalls, 69s. 6d. for second size, 72s. 6d. for bold.

Marangu.—At 82s. for bold.

Demerara.—At 66s. 6d. to 68s. 6d. for Liberian.

Jamaica.—At 59s. 6d. to 60s. per cwt.

Costa Rica.—At 60s. to 70s. 6d. for smalls, 63s. to 72s. for good ordinary to middling, 76s. 6d. to 81s. 6d. for good middling, 73s. 6d. to 86s. 6d. for low middling to fine bold, 92s. 6d. to 93s. for very fine bold.

Guatemala.—At 53s. 6d. to 64s. 6d. for smalls, 60s. 6d. to 74s. 6d. for good ordinary to good middling, 74s. to 81s. for bold, 94s. to 95s. for Maragogipe.

Salvador.—At 62s. for smalls, 64s. 6d. for fine ordinary bold foxy, 69s. to 75s. for low middling to good middling, 74s. to 81s. for good mid. to good bold.

Nicaragua.—At 57s. for good ordinary foxy green, 73s. 6d. to 82s. for middling to good middling coloury, 86s. to 95s. 6d. for good to fine bold coloury.

Vera Paz.—At 73s. to 88s. for low middling to fine middling, 87s. to 104s. for fine to very fine bold, 107s. to 107s. 6d. for Maragogipe.

Mexican.—At 53s. 6d. to 64s. for smalls, 51s. 6d. to 53s. for common, 69s. 6d. to 74s. 6d. for low middling to good middling, 74s. to 80s. for bold, 97s. 6d. for Maragogipe.

Coco-nut Products, &c.

IN spite, report Messrs. Mordaunt Bros., of an occasional spurt in prices towards the end of May, June opened with a dull market, and prices still falling. June 6th left Cochin coco-nut oil at 41s. to 41s. 3d., and Ceylon 37s. c.i.f., against 36s. 3d. for Pressed Oil, and 36s. 6d. to 36s. 9d. f.o.b. Hamburg for Palm Kernel Oil. June 13th found prices and quotations as under:—

<i>Palm oil (Liverpool):</i> 1914		1913	1912
Per cwt.			
Lagos ...	29s. 9d. to 30s. 3d.	31s. 6d. to 31s. 9d.	27s. 6d. to 28s.
Benin ...	27s. 9d. to 28s.	29s. 3d. to 29s. 6d.	26s. 6d. to 27s. 6d.
Congo ...	25s. to 25s. 6d.	26s. 6d. to 27s. 6d.	26s. to 26s. 3d.
Bleached ...	30s. 9d. to 32s.	33s. 6d. to 34s. 6d.	30s. 6d. to 31s.
Clarified ...	28s. to 29s. 6d.	29s. 6d. to 30s. 6d.	27s. to 27s. 6d.
<i>Palm kernel oil</i>	35s. to 35s. 6d.	42s. to 43s. 6d.	35s. 3d. to 35s. 6d.
<i>Coco-nut oil:</i>			
Cochin ...	50s.	52s.	43s.
Ceylon ...	40s.	47s.	41s. to 41s. 6d.
English pressed	34s. 6d.	None	34s. 6d. to 35s.
<i>Copra oil:</i>			
Ceylon ...	None	None	38s. 6d. to 39s.
Cochin ...	42s. 6d.	50s. 3d.	41s. 3d. to 42s.

According to the *Public Ledger*, prices on June 12th were:—

Soya Oil.—Oriental easier (in cases) afloat, £25 10s. c.i.f.; March-April, nominally, £27 c.i.f.; April-May, £25 15s. c.i.f.; May-June, £25 15s. c.i.f.; June-July, £25 15s. c.i.f.; July-August, £25 17s. 6d. c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £42; May-June, £38 c.i.f.; June-July, £38 c.i.f. Cochin spot, £51; August-October, £42 c.i.f.

China Wood Oil.—London spot, £28 15s.; April-May, £26 c.i.f.; May-June, £26 c.i.f.; July-August, £26 c.i.f.

Palm Oil.—Lagos on spot, £34.

Palm Kernel Oil.—Prompt, £37 10s.; May-June, £37 5s.; July-December, £36 15s. f.o.b. Hamburg.

Soya Oil Beans.—Parcels spot and afloat, £8 2s. 6d.; June-July, £8 5s.; July-August, £8 6s. 3d.; August-September, £8 8s. 9d. Hull.

Linseed Cakes.—London made, £7 15s. to £8.

Cotton Cakes.—London made, £4 15s. to £4 17s. 6d.

Copra slow of sale. Malabar, April-May, £26 15s. sellers, and May-June, £26 15s. Hamburg. Ceylon, April-May, £26 sellers Hamburg. Java, March-May, £24 17s. 6d. paid and value, and May-July, £24 17s. 6d. Holland, Hamburg and Bremen. Macassar, March-May, £24 12s. 6d. sellers Holland, Hamburg and Bremen. Singapore, April-May, £24 12s. 6d. paid Hamburg. Cebu, May-June, £24 10s. sellers. South Sea Island, April-May, £24 12s. 6d. sellers London. F.M. Straits, April-May, £24 10s. paid and buyers Marseilles. Manila, April-June, £24 sellers, and May-July, £24 Marseilles. Mixed no Padang, April-June, £23 18s. 9d. sellers, and June-July, £23 18s. 9d. Marseilles, all c.f. and i., delivered weight.

Coco-nut Oil.—Messrs. Goodlake and Nutter report that in the early part of the week the markets were very flat for oils, and Ceylon oil particularly was almost unsaleable. Business was done for near at hand at about 35s. 1½d., and more distant was offering at 35s. 6d. However, on covering in on the part of bears for copra, palm kernels, &c., these markets advanced considerably, and had the effect of firming up Ceylon

oil. Now, however, that the buyers are somewhat satisfied we have a quieter market. We quote June-July and July-August, 35s. 7½d. sellers. Cochin oil is still very inactive. We quote 39s. 6d. for Post monsoon. Palm Kernel Oil advanced considerably in sympathy with kernels, and after 34s. 6d. had been accepted for July-December, 35s. 1½d. has been refused. This market, however, is easier again, and there are sellers at 35s. for this position, and 35s. 3d. July f.o.b. Hamburg, but a bid of a little less would probably go through. Pressed Oil is still almost unsaleable. We quote 35s. sellers June, 34s. 9d. September-December f.a.s. London in Ceylon casks. Spot prices: Ceylon, £40 to £43; Cochin, £48 to £52.

WE are informed that the Dutch Colonial Institute formerly situated in Haarlem has been transferred to Sarphatistraat 36, Amsterdam.

The India-rubber Market.

UP at Liverpool, during the first week in June, the Pará market was quiet and slightly easier, with prices reduced ½d. to ¼d. per lb., values at the close being: Hard fine spot to June-July, 2s. 9¾d.; July-August, 2s. 10d., and August-September, 2s. 10¼d.; Soft fine June-July, 2s. 5d.; scrappy negroheads, 1s. 8¾d.; and Peruvian ball, 1s. 8¼d. per lb. Medium Brazilian grades have been idle and unchanged all week. Only retail sales of African have been made, including Benin Plantation Smoked Sheets, 2s. 9d.; Conakry sheets, 1s. 11¼d.; selected Gold and/or Ivory Coast lump, 1s. 1d., and ditto rejections, 11½d. to 1s. per lb.

During the next week ending June 12th the market was quietly steady, but closed rather firmer, and values were: Hard fine spot and June-July, 2s. 10d.; July-August, 2s. 10¼d.; August-September, 2s. 10½d.; Soft fine June-July, 2s. 4½d.; scrappy negroheads, 1s. 8d.; and Peruvian Ball, 1s. 7½d. per lb. Medium Brazilian grades are unchanged on the week, and the market is idle. The African market has been steady but slow, and the sales include smoked Benin Plantation sheet, 2s. 9d.; smoked Benin Plantation scrap, 1s. 9½d.; Sierra Leone niggers, 1s. 6d.; Gold and/or Ivory Coast selected lump, 1s. 1d., ditto rejections, 1s.; Niger Gutta, 9d.; Conakry sheets and strings, 1s. 11d.; Rio Nunez strings, 1s. 11½d.; Conakry niggers, 1s. 8d.; and Lahou sheets, 1s. 9d. to 1s. 10d. per lb.

In London the market for Plantation this week (ending June 12th) opened weak and lower, but closer firmer, with Standard Quality No. 1 Crêpe on the spot 2s. 3½d. buyers; June delivery sold at 2s. 3¾d. to 2s. 3d.; closing buyers at 2s. 3¼d.; July-September, 2s. 2¾d. sellers; July-December sold at 2s. 2¼d. to 2s. 2d.; January-March (1915), 2s. 1¾d. value, and January-June, 2s. 1½d. Smoked Sheet (ribbed) spot, 2s. 4d. sellers; June delivery, 2s. 3¾d. value; July-September, 2s. 3d. sellers; July-December, 2s. 2¾d.; October-December, 2s. 2½d.; and January-March (1915) 2s. 2d.

Pará continues quiet and rather easier. Hard fine on the spot, 2s. 10d. sellers; May-June delivery, 2s. 10d.; June-July sold at 2s. 9¾d., and buyers and

July-August at 2s. 10d. and buyers; August-September, 2s. 10½d. sellers. Soft fine dull, with sellers on the spot at 2s. 4¾d. and June-July delivery at 2s. 4¾d.

According to Messrs. S. Figgis and Co.'s report, at the auctions on June 9th—11th, 996 tons of Eastern Plantation kinds were offered and sold with good competition. Prices opened at about ½d. below last sales' rates, but recovered this later, and there was little change at the close. Standard Crêpe is now 2s. 3¾d. to 2s. 4d., Ribbed Smoked Sheet 2s. 3¾d. against Hard Fine Pará 2s. 9¾d., Soft Fine 2s. 5d., and Caucho Ball 1s. 7¾d.

Prices realized at the sales included Malaya Crêpe, Standard Latex, thin and thick, 2s. 3¼d. to 2s. 4¼d.; stained and streaky palish, 2s. 2½d. to 2s. 3¾d.; light brown and grey, part streaky, 2s. 2d. to 2s. 3¼d.; fair to good clean brown, 1s. 11¾d. to 2s. 2½d.; dark and specky brown, 1s. 8½d. to 1s. 11½d.; dark and black, part pressed, 1s. 7¾d. to 1s. 10¼d.; dark and black, inferior, 1s. 4½d. to 1s. 7½d.; dark to good smoked, 1s. 9½d. to 2s. 2d.; cured by "Byrne" process, dark to good (sheet, 2s. 1½d.), 1s. 9¼d. to 2s. 3¾d. Sheets, Standard Smoked (Highlands, 2s. 4¾d. to 2s. 5½d.), 2s. 3¼d. to 2s. 4¼d.; damp, mouldy, and part smoked, 2s. 0½d. to 2s. 3¼d.; fair to fine unsmoked, 2s. 2¼d. to 2s. 3d.; damp, mouldy, and stuck (inferior, 1s. 9¾d.), 1s. 10½d. to 2s. 1½d. Block, pale Lanadron, 2s. 4¾d. Scrap and Virgin, fair to good, 1s. 6½d. to 1s. 9½d.; mixed and inferior, 1s. 1¾d. to 1s. 6d.

Ceylon, Crêpe, Standard Latex, thin and thick, 2s. 3¼d. to 2s. 4½d.; streaky and stained palish, 2s. 2½d. to 2s. 3¾d.; light brown and grey, part streaky, 2s. 2d. to 2s. 3d.; fair to good clean brown, 2s. to 2s. 2½d.; dark and specky brown, 1s. 8½d. to 1s. 11½d.; dark and black, part pressed, 1s. 7½d. to 1s. 10d.; smoked fair, 1s. 8¼d. to 2s. 1½d.; cured by "Byrne" process, good, 2s. 4¾d. Sheets, Standard smoked, 2s. 3¼d. to 2s. 4d.; damp, mouldy, and part smoked, 2s. 1½d. to 2s. 3¼d. Sheets and Biscuits, fair to fine unsmoked, 2s. 2½d. to 2s. 3¼d.; damp, mouldy, and stuck, 2s. to 2s. 1½d. Scrap and Cuttings, fair to fine, 1s. 6¾d. to 1s. 9d.; mixed and inferior, 1s. 1½d. to 1s. 4½d.

As the sales progressed, reported Messrs. Lewis and Peat, Smoked Sheet rose ½d., and all grades of Crêpe about 1d. per lb., but the latter eased off again slightly, the sales finishing early on the third day, with both grades at a full ½d. above the opening prices, and quite steady against the close of the previous auction. The bidding was fairly brisk, the competition for Standard Crêpe being at times very keen, and nearly everything was sold. Crêpe cured by the "Byrne" process was in good demand, although the prices paid were somewhat erratic, up to 2s. 4¾d. being paid for one lot, and as low as 2s. 3d. for the first grade. Lanadron Block sold readily at a full penny above Standard Crêpe. Highlands Smoked Sheet realized 2s. 4¾d. to 2s. 5½d.

Pará rubber statistics for the month of May (tons):—

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará	1,680	1,210	= 2,890	agst. 2,880	3,410	3,060
Shipments to Europe	880	650	= 1,530	" 1,720	1,130	1,720
" " America	1,340	570	= 1,910	" 1,610	1,900	1,010

Crop statistics—June 30th, 1913, to May 31st, 1914 (11 months):—

	Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10.
Pará	{	1913-14	28,180	8,900			
Receipts	{	1912-13	31,010	8,840	37,080	39,850	36,790
"	Shipts.	Europe	14,570	4,790	19,360	22,730	18,390
"	"	America	13,950	4,100	18,050	18,720	19,400
							12,650
							16,560

Sugar.

THE American market, reported Messrs. Czarnikow, Ltd., on June 11th, moved from 3.33 to 3.29 to 3.33 cents, the temporary depression being due probably to better Cuban weather and fair receipts. The output shows there were on May 31st 2,244,000 produced against 2,069,000 tons, leaving 256,000 against 359,000 tons, viz., 100,000 tons less than last year to be received in June/October, otherwise the crop would exceed 2½ million tons.

Here the market was almost entirely influenced by the weather, which at last has turned warmer, and the crop which was retarded lately is progressing well, and may make up for time lost. October/December therefore receded from 9s. 7¼d. to 9s. 6½d., improving to 9s. 7d. on American firmness, and August moved from 9s. 7¾d. to 9s. 6½d. to 9s. 7¼d. A fair business was done in transferring August to new crop, but it is still considered possible that the August premium may give way to a slight discount when larger settlements have to take place.

In America the market further declined from 3.32 to 3.29 cents for 96 per cent. Centrifugals, but has since recovered to last week's level of 3.32 cents = 10s. 7½d. c.i.f. New York. For July Cubans a speculator paid 3.35 cents. Against this cane sugar in the United Kingdom has been rather slow of sale. The few transactions in refining grades have been at about previous rates. Grocery Crystallized at auction sold in moderate quantities at unchanged values.

As regards cane-producing countries mail advices from the West Indies state that in British Guiana the rainy season has set in. In Trinidad fine weather has enabled the reaping of the crop to be proceeded with. A cable from Barbados reports that a few showers have fallen, but more rain is wanted. The last Formosan crop seems to have turned out only 2,100,000 piculs Centrifugals, but Japanese markets remained very quiet owing to large stocks of Javas held there, and to slackness of trade with China, where the depredations of the "White Wolf" bandits checked business. The plantings for the coming Formosan crop were increased by turning rice fields into sugar plantations owing to low prices of rice, and the area is estimated at 50 per cent. increase. Furthermore, plantings were effected earlier, so that a crop of 3½ to 4 million piculs Centrifugals is expected, even if some damage should be done by storms later on. The Louisiana crop has been benefited by warm weather; though still behind, planters hope for normal growth. Rain is needed, especially in some sections, but fields are clear from grass and able to receive full benefit of a first shower.

The total transactions for the week amount to about 4,000 bags, and include Crystallized Demerara, good middling to good yellow, 13s. 6d. to 13s. 9d. duty

aid; good bright yellow, 14s. to 14s. 6d.; fine pale, 13s. 4½d. Syrups, middling yellow, 11s. 6d. Crystallized Trinidad, low middling to middling yellow, 13s. 1½d. to 13s. 3d.; deep bright yellow, 13s. 4½d. to 13s. 6d. Crystallized Jamaica, middling to good middling yellow, 13s. 3d. to 13s. 6d. Crystallized St. Kitts, middling yellow, 13s. 3d.; good middling ditto, 13s. 6d. Syrups, middling greyish yellow, 11s.; good yellow semi-grainy, 12s. 6d.

The London Cocoa Market.

By THE EDITOR.

JUNE brought in its wake Whit Monday, which fell on the very first day of the month, and this being a Bank Holiday, no sales were held until the 9th, when the demand and the prices realized did not disturb the placidity of the market, which is quiet but steady. As can be seen by the prices quoted later on, Grenadas were sold at practically the same prices as they did last month. Jamaicas were, if anything, rather dearer, at least for the finer qualities, and the demand for all West Indian kinds was stronger for the best qualities than for the cheaper grades, which, at the moment, are neglected. Havre, judging by its April and May movements, has not been having a very busy time, for, as shown by its stock, there were some 287,427 bags on hand on May 31st, against only 228,831 at the end of March. This means that 59,500 bags have been received in excess of the deliveries, a substantial amount for so short a period.

Before discussing the market generally, perhaps it would be as well to give the movements and stocks at the various centres. Taking Lisbon first, Messrs. Martin, Weinstein and Co. have sent me the following figures:—

			Bags
Stock on hand April 30th	...	...	97,531
Landed during May	...	...	26,063
	Gives	...	123,594
Less delivered during May	...	...	38,075
Leaves stock on May 31st, 1914...	...	...	85,519
Against " " 1913...	...	...	58,655
" " " 1912...	...	...	90,097

This centre, therefore, shows a decrease of 12,000 during May, compared with an increase of nearly 7,000 bags at Havre (287,427 bags against 251,000 on April 30th, as given in the last issue), whilst London on June 13th stood at 93,336 bags, against the 81,341 bags on May 6th, given in my last report. Here are the details of the London and Havre stocks at the time of going to press:—

Havre Stock, May 31st—	1914 Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Pará ...	10,953	70 to 74	14,456	80 to 85
Bahia ...	18,587	65 " 75	12,429	82 " 87
Venezuela ...	57,135	71 " 200	42,206	85 " 180
Trinidad ...	41,202	70 " 75	23,752	85 " 89
Grenada and O.W.I.	3,116	66 " 73	4,230	79 " 87
San Thomé ...	6,967	73 " 75	7,041	86 " 88
San Domingo ...	2,929	63 " 65	4,970	73 " 78
Haiti ...	11,697	58 " 72	6,817	68 " 82
Accra kinds ...	90,450	66 " 68	56,037	76 " 80
Guayaquil...	33,693	72 " 77	17,591	88 " 95
Various ...	10,698	—	10,541	—

Totals ... 287,427 bags

200,070 bags

London Stock, June 13th—	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads ...	9,274	8,837	7,764
Grenadas ...	11,151	8,206	5,655
Other W.I. ...	4,760	3,491	7,710
British Africa ...	15,809	10,728	9,696
Portuguese Africa ...	3,335	5,073	4,488
German Africa ...	2,790	4,177	6,886
Ceylon and Java ...	9,633	21,006	16,731
Guayaquil ...	25,217	296	2,415
Brazil and Bahia ...	2,337	12,392	44,048
Other Foreign ...	9,030	7,135	6,913
Totals ...	93,336	81,341	112,306

Coming now to consumption, I am sorry to see that this country makes a very poor show as regards deliveries for consumption in May, both with raw cocoa as well as foreign manufactured. Of the first (raw cocoa) only 2,100 tons were delivered last month, against 2,981 last year and 2,584 tons in May, 1912, whilst the total movement for the five months, January-May, are returned as follows:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (May 31st) Tons.
Jan.-May, 1912—	17,098	11,761	2,743	12,115
" 1913—	17,822	12,447	3,326	10,995
" 1914—	22,817	13,395	3,256	16,224
	Incr. 4,995	Incr. 948	Decr. 70	Incr. 5,229

Foreign Manufactured—	May only Landed.	Del'd H.C.	Jan.—May. Landed.	Del'd H.C.
1914 ...	875	856	4,310	4,344 tons
1913 ...	1,149	1,055	5,083	4,915 "
1912 ...	645	587	3,787	3,981 "

Between the two kinds, therefore, raw and foreign manufactured, there was a decrease of nearly 1,100 tons in the deliveries for home consumption in this country. With the decidedly cool weather we were having, *plus* the moderate price at which all grades of cocoa are now obtainable, it is difficult to find a reason for such a poor May in this country.

As regards other countries, I have compiled the following, based, as regards this year, on the *Gordian's* (of Hamburg) estimates for April and May in all cases, except this country, when the figures are for actual deliveries. Note the substantial increase in the Dutch figures:—

Consumption figures, six chief centres, January-May.

	Tons 1911	Tons 1912	Tons 1913	Tons 1914
Five months—				
U.S.A.	32,969	36,067	32,405	40,691
Germany ...	22,175	25,661	23,342	24,634
U.K.	9,671	11,761	12,447	13,395
France ...	10,733	10,600	10,537	11,350
Holland ...	9,359	12,469	14,604	17,962
Belgium ...	2,000	3,025	2,269	2,725
Comparative totals	86,907	99,583	95,604	110,757

Against this my Hamburg contemporary gives the following outputs at the undermentioned centres in tons of 1,000 kilos. Many of the months this year are only estimated.

	Tons 1911	Tons 1912	Tons 1913	Tons 1914
Production—				
Jan.-May.				
Ecuador ...	17,342	20,246	12,048	25,038
Trinidad ...	13,554	15,014	15,212	22,250
Venezuela ...	7,722	6,153	10,163	8,000
Grenada ...	3,639	4,085	3,949	4,490
San Thomé ...	11,687	10,184	10,909	12,098
Accra ...	16,888	16,627	23,938	28,933
Samana ...	8,927	8,432	6,415	5,637
Bahia ...	13,409	7,687	5,508	16,681
Comparative totals	93,168	88,428	88,142	123,127

Including the sales on June 9th prices in mid-June were about the following:—

Trinidads.—None have been sold lately, but prices are based as follows: 58s. to 58s. 6d. for mid. red, 59s. to 60s. for good middling to good red, and 61s. to 64s. (nominal) for fine to superior marks.

Grenadas.—Fine are valued by some importers at 58s., but did not sell above 57s., except a few lots which realized 57s. 6d., good to fine marks selling at 55s. to 57s., whilst common unfermented to fair fermented for which there is no demand and no sales reported, are worth 51s. to 53s.

Dominicas.—Good to fine sold at 54s. 6d. to 56s., fair fermented 52s., and ordinary grades down to 49s. 6d.

Jamaicas, as already stated, sold well, good bold red, 58s. to 58s. 6d.; good reddish, 57s. to 57s. 6d.

St. Lucia.—Good red sold at 57s., fair reddish at 54s., and common unfermented at 49s.

Mauritius.—Plumpish, but rather small, realized 76s. for a small lot of eight bags.

British African seem to rather drag. Liverpool reports a dull market with nothing doing, and sales generally have been restricted, whilst Havre, as can be seen, has over 90,000 bags on hand. Actual sales include Accra kinds at Liverpool at 49s. to 52s. 6d., against about 58s. to 63s., as mid. prices last year.

Cameroons are valued at 56s. to 58s., against 60s. to 61s. for superior Bahias, and 57s. for San Thomé.

Samoa.—Good bold reddish, 68s.; fine bold, 79s. 6d.

Rio Caribe (Venezuelan) realized 71s. to 72s.

Costa Rica.—Fair reddish, 54s.; bright red, 58s. 6d.

Guayaquils seem to be firmly held on the other side, although the output continues on an expansive scale, and the end of May receipts were more than twice the size of last year's (544,000 qtls. against 267,500 qtls. last year and 442,900 qtls. in 1912). No sales were reported at the end of May, but since then some common Caraquez has been sold at 55s. 6d. to 56s., against 57s. to 59s. for good, and 59s. to 64s. as the extremes for Arriba.

Ceylons have been in small supply, the crop so far being but half last year's output. Fair medium to good bold sold at 76s. to 80s. 6d., ordinary to fair 67s. 6d. to 72s. Fine bold would be worth something over 83s.

June 13th found the Liverpool market very dull, it being difficult to interest buyers in any description, even at a further reduction of 6d. to 1s. per cwt. on recent rates. Sales reported include 2,000 bags of Accra kinds at from 47s. 6d. to 50s., ex quay, in transit, as to quality, and 125 bags of Pará at 57s. per cwt., ex store, in bond.

The auctions in London on June 16th were fairly substantial and included 3,758 Grenadas, which met with a fair demand from the home manufacturers, but sold at lower prices, say, good to fine marks, 54s. 6d. to 56s., fair to good, 52s. to 54s. Good mid red Trinidads realized 59s., and good to fine red are worth 59s. 6d. to about 61s. Superior sold privately at 66s. Other West Indian are 1s. or 1s. 6d. below prices quoted for June 9th in sympathy with Grenadas.

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[Owing to extreme pressure on our space we have been unable to include any photographs and are compelled to withhold our Tea Notes, Tobacco Planting and other articles that we should like to have included.]

The Death of Mr. Joseph Chamberlain.

Is it a melancholy or a memorable coincidence that just when the existence of the Tropics, to-day so indispensable to the dweller in the temperate zones, has been so forcibly driven home to Londoners and, through the press, to Englishmen generally, that the man to whom the English Tropics owe so much should be taken from us? Within a few days of the unveiling of the tablets at the London School of Tropical Medicine, commemorating its indebtedness to Mr. Joseph Chamberlain and his son, to which we refer elsewhere, we heard with regret that Mr. Joseph Chamberlain had passed away peacefully at his London residence, 40, Prince's Gardens, S.W., at 10.15 p.m. on Thursday, July 2nd. Although of late years politics, like commerce, and, we suppose, life generally, have tended to become more specialized and split up, when one remembers Mr. Chamberlain, as we always like to think of him, at the start of his public career, when he was one of the greatest municipal reformers and civic re-organizers that we have had among us, we feel that had Mr. Chamberlain at that time enjoyed the influence and popularity that were afterwards his, he would have followed Gladstone as Prime Minister, and done far more to develop our tropical and colonial dependencies and to put the whole question of the development of the Empire's resources on a much broader and firmer basis than they are to-day, or are likely to be for some time to come. He would, we believe, have done this, not by fiscal changes, but by seeing that each man did his share of work, and not leave it for the many to fatten on the energies and enterprise of the few who had "made good," and were therefore capable of being bled by others who had not their energy or the enterprise to follow their example, nor the wish to undergo the times of trial and tension that is the lot of all who leave their mark in the world as builders of Empire, whether they are men like Rhodes, in the front rank or among the lesser known, but none the less useful crowd that are compelled by their very nature to push on abroad, instead of taking things easy at home. Outside of all politics such men as Mr. Joseph Chamberlain are indispensable to a great nation. The very stock they spring from adds to their value, and so, when such a man is taken from us, we are forced to stop still and "take stock" of the progress made by the country and the Empire, thanks to his work. The columns and pages devoted to recalling Mr. Chamberlain's career bear eloquent testimony of the valuable services he has rendered to his country as a citizen of Birmingham, as a politician, and as the most energetic Colonial Secretary that we have yet known.

The Practice of Cacao Fermentation.

By ARTHUR W. KNAPP, B.Sc.Lond., F.I.C.,
B.Sc.Birm.

(Continued from p. 104.)

PART V.

APPENDIX G.

SWEATINGS.

THESE are generally allowed to run into the ground in the immediate neighbourhood of the sweat-box. This is bad, for



Sweating-boxes. The man is holding the wooden spade used for turning.

the air round the sweat-box should be kept as sweet as possible. The sweatings should be collected in a clean, covered cement-lined pit, or better, in a glazed earthenware pot. It has been frequently suggested that sweatings might be commercially converted into varnish or vinegar. I found in one experiment that a barrel (300 lb.) of wet beans gives a little more than $1\frac{1}{2}$ gallons of sweatings, thus

After 18 hours ...	...	7.2 pints
From 18-40 hours ...	...	5.2 „
Total ...	...	12.4 „

or roughly 1 cwt. of dry beans gives $1\frac{1}{2}$ gallons. The amount of sweatings naturally varies according to the juiciness of the pulp and will be found to contain about 15 per cent. of solid matter, about half of which appears to be sugar. The acidity is at first a little less than 1 per cent., reckoned as acetic acid. A sample which I left in an open, but covered, jar for nine weeks reached a final acidity of 1.9 per cent. The sweatings contain a fair percentage of a gelatinous colloid (pectin) which appears hitherto to have been overlooked. However, considering the difficulty of conveyance of simple machinery (*e.g.*, for bottling) to the plantation or the cost of carriage of the fermenting sweatings to a centre in the town, there is little prospect of making profitable use of the sweatings. To obtain a pleasant vinegar would require more intelligent labour than is readily available.

Under present conditions the only way to produce a uniform product would be to boil (*i.e.*, sterilize) the sweatings as soon

as collected (thereby, unfortunately, losing some of the alcohol and pleasant-smelling esters), and when cold add a pure culture. In Trinidad there must be over 500,000 gallons of this unstable liquid going to waste every year, but at present there are many difficulties in the way of working the sweatings commercially, the chief being that the quantities to be treated in one place are small. This difficulty and others would be readily surmounted if the cocoa from some twenty estates were conveyed *in the pod* to a central factory near a large town. Such a factory could afford to employ a chemist and an engineer, and fermentation and drying would be put on a scientific basis. Doubtless the fermentation would be assisted by pure cultures. Under these conditions the sweatings (as vinegar or a drink resembling cider) would become a valuable by-product, worth probably 5 per cent. of the cocoa produced. Further, the pectin in the pods and sweatings might be used as a basis for jelly-making.

APPENDIX H.

DURATION OF FERMENTATION.

It is possible to continue the fermentation too long. This is indicated by the growth of mould; and if the beans are left for fourteen days, they will probably become grubby. The growth of mould is always a great danger, and the following hints to improve and increase the speed of fermentation may be found useful:—

(1) Cover the beans immediately they are put in the box.

(2) *Use of Sweatings.*—Carefully save the clean sweatings which come from one box of beans, and pour over the box picked on the following day. It was found that the beans so treated were one day ahead of untreated beans throughout the



Cars of cacao, covered with banana leaves, arriving at the fermenting or sweating-house.

fermentation. The beans produced had a fine plump appearance, were superior to those obtained by ordinary methods, and gave an excellent product on roasting. Another experiment showed that time could be saved in the same way by adding about 1 pint of yeast (from a brewery) to 8 cwt. of beans, as soon as they were put in the box. An attempt

to make use of the dry cakes of *tinned yeast* sold to bakers, was not so successful.

(8) When, because the pulp on the bean is very dry, or for other reasons, moulds tend to develop, the addition of 1 lb. of glucose in 1 gallon of water will encourage the right kind of fermentation. Raw cane sugar might work almost as well.

APPENDIX J.

RISE OF TEMPERATURE.

The temperatures given are those that should be obtained in Trinidad, with a box 4 ft. by 4 ft., packed with beans to a depth of 3 ft.

TAKING TEMPERATURES.

In taking temperatures the bulb of the thermometer should be placed as near as possible to the centre of the mass. The mass is generally warmest one-third of the depth from the surface, but the difference in temperatures, save for the very bottom, which is always colder, should not be more than 3° C. The following are examples of the less uniform readings taken :—

Depth from surface	Temperature, degrees Cent.			
4 in.	29, 34,	39, 38,	43, 44½,	43, 47½, 50
1 ft.	28, 32,	38, 41,	40, 47½,	46, 48½, 48
1 ft. 6 in.	30,	41,		48, 45
bottom	29½, 36,			38

In ordinary boxes the temperature of the mass naturally falls off a degree or two towards the outside, *e.g.* :—

Temperature C.	Box			Air outside
	Centre	5 in. from side	At side	
	48	46	43	30·5

The temperature is the simplest guide to the amount of fermentation taking place, and the uniformity of the temperature in all parts of the mass is desirable as showing that all parts are fermenting evenly.

In conclusion I may say that I could never have gathered the material of this paper but for the courtesy of the planters; and I publish it in the hope that it may be of interest to them.

(The End.)

HAVING discussed the Rio Acré, the Putumayo, the Tocantins, and other rivers up the Amazon with Mr. J. F. Woodroffe in connection with the book he is publishing on the rubber industry of that district, "we" retired to the upper reaches of our own beloved Thames to "Jesmond Cottage," Mrs. Malcolm Rafferty's comfortable establishment facing the old church at Shepperton, and spent a pleasant holiday, either sitting on the lawn watching the boating world go by, or more often by lying in a punt and being paddled or poled up to Staines or down Sunbury way whilst we studied the last volume of "Queer Stories" from *Truth*, which pleased us immensely, and leaves us still undecided as to which of the twenty-eight studies it contains of human life at home or abroad we preferred. "The Sale of the Vandyke" is certainly clever, and held to amuse all in the punt whilst we were held up under Walton Bridge during a shower, whilst both the Eastern tales, "The White Curl" and "Farideh," we read more than once. Those wishing to have as agreeable a time as we passed should follow our example, not forgetting to first buy the book referred to, which costs only one shilling as usual, from *Truth*, or any bookstall or bookseller.

Books Received.

THE RUBBER INDUSTRY IN BRAZIL AND THE ORIENT. By C. E. Akers, Chief of the Commission to investigate the production of Rubber. 320 pp., including index and many illustrations. Price 6s. net. Messrs. Methuen and Co., Ltd., 36, Essex Street, Strand, London, W.C.

THIS book, coming as it does from so prominent an authority, will be of prime importance to those interested in the production and manufacture of rubber. "During my investigations as Chief of the Commission working in the Orient in 1911-12 in connection with the conditions of the rubber industry," the author tells us at the start, "I was confronted frequently by the erroneous impressions prevailing among Eastern planters in regard to Brazilian methods and resources. I propose now to describe the essential conditions so as to enable accurate deductions to be drawn, and a correct comparison made between the plantation industry of the East and the production of wild rubber in the Amazon Valley. That the Orient has still something to learn from Brazil is evidenced by the efforts now afoot in both Ceylon and the Malay Peninsula to manufacture fine, hard, smoke-cured rubber to compete with the Pará product."

A TEXT-BOOK OF MEDICAL ENTOMOLOGY. By Walter Scott Paton, M.B.Edin., I.M.S. of the King Institute of Preventive Medicine, Guindy, Madras, and Francis William Cragg, M.D.Edin., I.M.S. of the Central Research Institute, Kasauli, Punjab. 767 pp., 89 plates. Price 21s. net. The Christian Literature Society for India. London: 35, John Street, Bedford Row, W.C.; Madras, and Calcutta.

This book will fill a long-felt want by those needing detailed accounts of the breeding and spread of insect life in India. Up to now the medical and veterinary officer practising in the Tropics has had great difficulty, even when successful in the end, to obtain the literature and information he needs in connection with applied entomology. This book will, we should imagine, go a long way to supply that want. The valuable collection of plates included within its covers, each with several figures of mosquitoes, anopheles, flies, ticks, &c., makes one truly thankful that such repulsive objects are so small. Truly those who maintain that were some insects as large as elephants, horses, or even dogs and cats, we should die of fright at the sight of them have not over-stated the case. Were they larger, however, perhaps they would be easier to exterminate. How these pests can be kept in check, if not altogether got rid of, is discussed throughout this most important work. The authorities quoted and discussed should alone make the student of medical entomology study it with great care, and a perusal of its chapters makes us hope that one or other of our agricultural entomologists will before long give to tropical agriculture what Dr. Paton and Dr. Cragg now offer to the tropical medical world.

Tropical Agriculture takes London by Storm.

THE CINDERELLA OF OUR INDUSTRIES AT LAST COMES INTO HER OWN.

H.M. the King bids her welcome by telegram, whilst His Ministers and the Foreign Plenipotentiaries from all Countries bid her Welcome to Court, and Lord Kitchener, Mr. Harcourt, and Lord Derby Preside at or Address the Conferences.

THE Tropics, at last, have come into their own. Like Cinderella, they have for long done the major part of the drudgery of the Imperial household, and the more they seem willing and able to do in administering to the comfort of the world's menages the more they seem to have been pushed in the background until the bulk of humanity only knew them as a myth, and whilst they believed many tales that were totally and hopelessly untrue about them, they refused to believe others that to those working to advance tropical medicine, sanitation, agriculture and commerce were as plain and palpable as daylight or the water in the sea.

Elsewhere (p. 131) we discuss a portion of Prof. Dunstan's Presidential Address delivered at the Imperial Institute, on June 23rd, at the opening of the Congress held there, and in future issues will appear notes and

criticisms on the various papers read on the cultivation and preparation of cacao, cotton, and rubber, on plant sanitation and pests, the shipment of seeds and seedlings from centre to centre, soil fertility in the Tropics, agricultural credit banks, and other subjects brought forward and discussed at various sessions. Briefly put, the Imperial Institute Congress was divided up as follows, and as we understand that the papers and discussions which followed will be published in book form as soon as possible, our readers can gather from the following some idea of the valuable information it will contain on the various subjects treated, and look out for the book when it appears.

June 23rd.—Presidential Reception of Delegates and Address. Discussion on "Technical Education in Tropical Agriculture" (six papers), followed by Mr. J. A. Hutton, Chairman of the British Cotton Growers' Association on the work of that body. Lord Derby in the chair.

June 24th.—Discussions (Morning) on "Sanitation and Hygiene on Tropical Estates," Sir Ronald Ross in the Chair. "Legislation against Plant Diseases and Pests," Sir Sydney Olivier, Chairman. (Afternoon) "Soil Fertility" (nine papers).

June 25th.—The morning was given up to Rubber. Afternoon to Rubber (eighteen papers in all); Section II, Cereals and Sugar (eleven papers); Section III, "The Utilization of Sun Power for Irrigation and other Purposes in Tropical Agriculture," by Mr. Frank Shuman.

June 26th.—Agricultural Banks and Co-operative Societies (three papers), The Organization of Agricultural Departments in Relation to Research (four papers), Oil and Oilseeds (eight papers), Cacao (six papers), Tobacco (five papers), and Professor Robert Wallace on "The Karakul Fur-bearing Sheep of Bokhara."

June 27th (Saturday).—The Congress did not sit.

June 29th.—Cotton in morning, Lord Kitchener in the Chair (twelve papers); Fibres in afternoon (nine papers).

June 30th.—Section I, Cotton, Mr. Lewis Harcourt in the Chair (nine papers). Other Sections, various subjects (twenty-three papers), including one on "Stump-pullers and Ploughs," on "Dry Farming," &c.

LORD KITCHENER'S INTEREST IN EGYPTIAN COTTON.

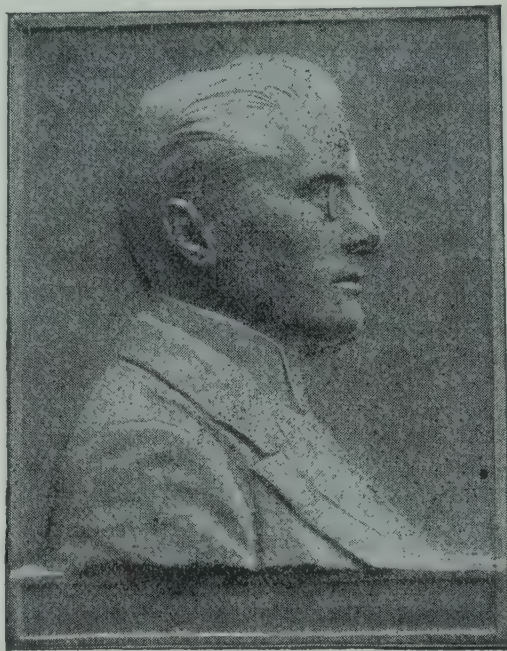
Field-Marshal Earl Kitchener, Agent and Consul-General in Egypt, whom Professor Dunstan reminded those present was a fellow agriculturist, since he owned an estate in East Africa, presided at the Congress during the morning of June 29th, when he spoke on the subject of cotton growing in Egypt, emphasising his statements by means of coloured diagrams, and assured

those present that he took a great interest in all matters connected with the production of cotton, and especially Egyptian cotton. He thought they might claim that, both as regards the relative quality and the yield, Egypt had maintained the premier position for many years amongst the cotton-producing countries.

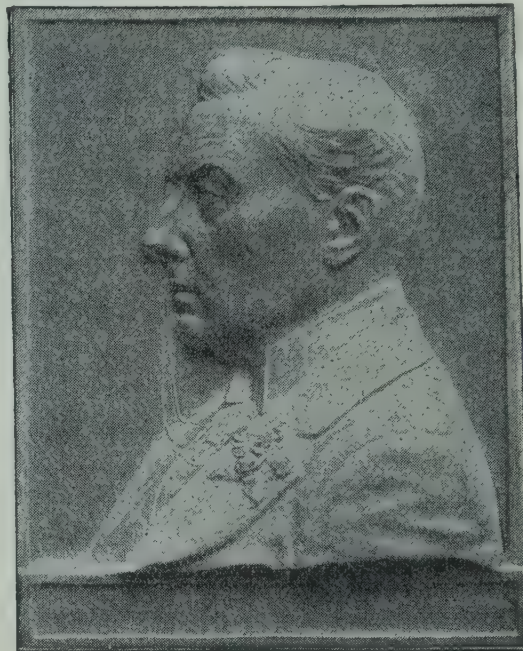
In a country like Egypt, scientific agricultural

methods must, in order to be acceptable to the fellaheen, be suggested in simple form for assimilation by them. The means at present adopted were having the desired effect, and prejudice and apathy were gradually being replaced by a more intelligent interest in the benefits attained by the observance of scientific principles. The value of scientific methods had been demonstrated to the fellaheen in a practical way by the treatment of 800 acres of absolutely waste land at Biala. At the end of 1912 it was so impregnated with salt that for ages nothing had grown upon it. After a scientific system of irrigation and drainage at a cost of £10 an acre, it was handed over to the fellaheen in five-acre plots for cultivation. Last year the land was washed and a crop of rice grown, and, to the great astonishment of the fellaheen, a permanent result had been achieved in one year which, under the ordinary system prevailing in the country, would have taken three to four years to accomplish, and even then, with inadequate drainage, the land would have been liable to go back to its original state. Cotton was now being satisfactorily grown on a fair proportion of the area, and it was hoped that it would bring in from £15 to £20 an acre.

When they considered that there were about



Mr. Austen Chamberlain.



Mr. Joseph Chamberlain.

1,500,000 acres of equally waste salt land in the delta awaiting development by drainage, the value of this experiment could be appreciated. He also believed that there was a great future in store for the Sudan as soon as the irrigation works on the Blue Nile were completed, enabling the vast area available for cotton cultivation to be fully developed.

The lesson that all the twenty or more papers on cotton drove home forcibly to our mind was the need to cultivate it along such lines as would tend to increase its quantity, quality, and uniformity. Breed pure, feed well, and cultivate adequately, was the advice given time after time. Although the words differed the meaning was always the same. Some of the leading speakers told us that the yield over wide areas was a disgrace to the cultivator, being only about 200 lb. per acre, and in such cases the amount of waste to the total crop gathered was enormous and out of all proportion to the large yields from well cultivated and adequately manured crops. Natural conditions favour increased waste, but scientific cultivation decreases the waste and increases the net yield per acre. Lord Kitchener said that proper cultivation and manuring were two of the four chief points to be remembered as essential to successful cotton growing. What we want is large crops of ginned cotton per acre, not wood and seed and rubbish; also hasten on the crop as quickly as possible to evade the pests that threaten. Cotton, to be King, said another, must be cheap. At present, said one of the delegates, cotton is grown as a rotation crop; the query that remains to be answered is whether we can grow it without rotation crops in between, but following on year by year, so as to obtain the maximum output per acre from the area under cultivation. The whole session, therefore, bristled with experimental work for the manure maker and seller, the plough and cultivator engineer, as well as the planter. We hope the lessons will not go by unheeded, but be followed up by those able to do so.

With two tropical Congresses to touch upon, with practically three exhibitions to talk about, with a telegram of welcome from the King himself, which we include on p. 131 under the heading of "Tropical Agricultural Colleges," and numerous receptions by His Majesty's Ministers and the learned societies to discuss, taking tropical medicine first, we can only briefly call attention to the unveiling, by Mr. Lewis Harcourt, of the portraits in bronze relief of Mr. Joseph Chamberlain and his son, Mr. Austen Chamberlain, M.P., which have been placed in the Albert Dock Hospital of the Seamen's Hospital Society as a memorial of the splendid work that they have done on behalf of tropical medicine. We must also be pardoned if we do no more than just touch upon the fringe of so glorious a galaxy of festivities and celebrations—all in honour of our Cinderella of the Tropics, "Nuestra Senorita de las Paises Tropicales."

At the last-named ceremony TROPICAL LIFE was represented by Mr. Victor Hamel Smith, brother of our Editor, who meeting Mr. Michelli, the popular Secretary of the School of Tropical Medicine, and Mr. Harcourt, had the pleasure of being introduced to the latter and remaining with him whilst the tour of inspection was made. Those present included Mrs. (Joseph) Chamberlain, Mr. and Mrs. Austen Chamberlain, Mrs. Endicott, Sir John Anderson (Colonial

Office), Sir David Bruce, Sir William and Lady Bennett, Sir M. M. Bhownaggee, Sir Henry Burdett, Sir T. Fowell Buxton, Sir F. and Lady Lugard, Sir Francis and Lady Lovell, Sir William and Lady Treacher, Mr. and Mrs. C. C. McLeod, Major and Mrs. H. Bryan, Dr. C. J. Martin, F.R.S., Surgeon-General and Mrs. Godfrey, Professor W. J. Simpson, Dr. and Mrs. Sandwith, and Mr. and Mrs. James Cantlie.

Speaking at the ceremony on June 23rd, Mr. Harcourt said that political differences never had and never could, in his case, blind him to the great services rendered in other spheres by those to whom, whilst they were his personal friends, he might happen to be politically opposed. It could seldom have happened to two men, father and son, to have their great services jointly recorded, and, happily, in the lifetime of both. Never in his opinion was such an honour so abundantly deserved.

Mr. Austen Chamberlain, in reply, expressed his thanks to Mr. Nairne and the Committee of the Seamen's Hospital for the erection of the memorial and to Mr. Harcourt for the kindly words he had spoken of the services of his father and himself to the hospital.

The portraits, the work of Mr. F. W. Doyle Jones, were then unveiled. We have been fortunate enough to secure photographs of these, which we have pleasure in reproducing on the opposite page.

Speaking the next afternoon at the opening of the Rubber Exhibition Mr. Harcourt, following after the speech by H.R.H. Prince Arthur of Connaught, told those present how deeply interested he was in the rubber production of the British Empire. It was an industry whose birth within our territories practically coincided only with the present century, but its growth in that time had been beyond expectation and belief. Last year the exports of rubber from the Straits Settlements, the Federated Malay States, and Ceylon alone reached the extraordinary total of 71,000,000 lb. in weight, of the value of £11,000,000 sterling. The production of the first five months of this year showed that the total output of 1914 was likely to far exceed anything that had preceded it. It was quite true that the price per pound had fallen, which was naturally regarded from different points of view by different individuals. Those who would be most seen at that exhibition were the consumers, and to them the fall in price might be described like another commodity—as grateful and comforting. It must not be forgotten, Mr. Harcourt reminded those present, that the success of the Schools of Tropical Medicine contribute greatly to the efficiency not only of the labourer, but also to the managerial staff. The Entomological Research Committee, under the presidency of Lord Cromer, has rendered great service in the study and extermination of insect pests,* and the Rubber Growers' Association have themselves established and financed research stations in Malaya and Ceylon, and have contributed much to the common stock of our knowledge on this subject. "I am glad," he concluded, "to see in this Exhibition a number of samples of other tropical and Colonial products which may be grown in conjunction with or, if

* And so, we would suggest to our Colonial Secretary, will the Institutes of economical botanical research, when we have them attached to the Agricultural Colleges that we trust will soon be established in the Tropics.

necessary, as an alternative to, rubber. The cultivation of fibres, cotton, coffee, and cocoa, and the extraction of oil, in various degrees and localities, is a considerable and important industry for the natives for whom we have undertaken both national and imperial responsibilities."

Finally, when presiding at the final session of the Congress at the Imperial Institute, when cotton-growing in the British Colonies and Protectorates was discussed, Mr. Harcourt said* it was a mistake to think they could grow any kind of cotton and find a market for it immediately. He looked with some alarm at the tendency to endeavour to grow or manufacture the finer grades, though he was not surprised at the temptation when he saw at the Rubber Exhibition a sample of Sea Island cotton which had been sold at 40d. per lb. They could not compel the whole world to dress or sleep in fine muslin or lace, and for the present, and perhaps for some years to come, the staple of the great industry was likely to remain the quality known as "Midland Upland." But trade in many parts of Lancashire was tending more and more to the finer kinds, and was consuming products of Egypt and the Sudan and many of our Colonies and Protectorates. He was now making great efforts to improve the railway communication in Nyasaland, the East African Protectorate, and Uganda, by a loan of £3,000,000 sterling, for which he was asking the authority and the credit of the Imperial Parliament. Northern Somaliland offered no openings for agriculture. Its principal products, for which there was no European demand, at present were Dervishes, camels, and Mullahs, but on the Juba River he thought there was a great opening for future development.

"I am told," he said, "that the Juba River has been constructed by a far-seeing—one might almost say a commercial Providence, with a series of terraces which might form a succession of natural barrages, if only the upper course of masonry is added by human agency. If this is done, there are miles of suitable land which could be irrigated by gravitation, with a prospect of unlimited crops of cotton and other tropical products." He looked forward to the time when Italy and this country would pursue a commercial *entente* which would contribute to the industrial prosperity of both lands.

Reviewing the work done by the Colonial Office, Mr. Harcourt said: "In these days the Colonial Office has more the attributes of an immense trading and administrative concern than those of earlier days, when it was a mere machine of government. My days and nights are spent in the study of medicine, in the details of railway construction, with a desire that the smallest sum of money may lay the largest number of miles of track in the fewest possible days. I am a coal and tin miner in Nigeria, a gold miner in Guiana. I seek timber in one colony, oil and nuts in another, cocoa in a third—copra and copal, sisal and hemp, cotton, coffee, tobacco are common objects of my daily care."

We hope that after the reception she has just given to the Tropical representatives, and those overseas whom they represent, that London and our leading cities will urge the Colonial Secretary, the Chancellor of the Exchequer, and others to assist and push on a scientifically organized system of effort to develop the Tropics along the best lines by willing and well-trained helpers attracted thence in increasing numbers.

The Competitions for the "Tropical Life" Medals at the Rubber and Tropical Exhibitions.

THIS section of our work interfered considerably with our attendance at the Rubber Congress. As, however, it was important for those who had gone to trouble and expense to prepare and send over the samples to be entered, we, on our part, spared no pains to make the competitions in every way the success they deserved to be. Our only regret was that a number of entries* arrived altogether too late to be included; for this we were truly sorry, but after making the terms as elastic as possible we could only shut them out. We hope another year that the planters and the Government departments, &c., will take more careful note of the circulars and advertisements that we, and also Mr. Staines Manders, sent out (over 10,000 between us), and will remember the date on which the competitions close. There were many samples of excellent sisal, and also of Ceará rubber, copra, &c., in the Exhibition that should have been entered, but no one did so, apparently because what was everyone's business was no one's business. Another time we will see that such samples are not omitted.

At the same time the entries gave a valuable object lesson to the large number of visitors to the Agricultural Hall. The knowledge that the produce was for the TROPICAL LIFE Competitions, a fact advertised on all sides by large boards painted in pale blue and gold, centred attention on the samples and the estates producing them in a way that was not obtainable by the same samples when on the stalls, no matter how attractively they were laid out. On the stalls they were but one of many, but on the sampling counters up in the galleries visitors wished first to know why they were there, and secondly to watch the proceedings when the judging was in progress. This turned out more difficult than we estimated, and the best thanks are due on behalf of the competitors and ourselves to those gentlemen who so kindly helped us in the matter. Mr. Walker, of Messrs. S. Figgis and Co. (whose name is well known to our readers in connection with the report of the rubber market with which they have supplied us since TROPICAL LIFE first started), and Mr. H. W. F. Ide, of Messrs. Ide and Christie, came all the way from Mincing Lane to judge the Ceará rubber, sisal, and coir fibre respectively. Mr. Ide is undoubtedly the best judge of fibres in London, and no one can be connected with the production or sale of these for long without coming into close contact with him. Mr. Walker took great care in handling the rubber to discriminate between

* The conditions for the above entries, it will be remembered, were that "the produce has been dried, cured, or otherwise prepared for shipment, by machinery, or other labour-saving and mechanical appliances which can be classified as machinery. Purely sun-dried produce, or hand-cleaned fibre (even when the latter is dragged by hand through knives, as with Manila hemp in the Philippines), will not be eligible. Engineers whose machines have prepared the exhibits, as well as planters, or shippers of the produce from the other side, will be eligible to enter the lists; and when sending entries in, it is agreed and understood that the competitors are fulfilling the above conditions, and any infringement will lead to disqualification. The judges have the right to call upon any competitors to whom they have made an award or awards to sign a declaration to the effect that they have complied with the conditions."

* See *Daily Telegraph* of July 1st.

a showy appearance and unpretentious tensile strength and nerve, and in doing so proved himself a worthy representative of the firm on whose behalf he signed the award. The Robusta coffee we took to Mr. Mumford, who has had over twenty-five years' experience in the coffee and cacao department of Messrs. Lewis and Peat. For copra we secured the services of M. Henri Woog, of Paris, a large international buyer who has carefully studied this article. As it was somewhat difficult to decide whether sample No. 1 was better than No. 2, or *vice versa*, it was decided to submit samples for analysis to Mr. Rivers Bolton, the well-known analyst and co-author of "Fatty Foods." He confirmed M. Woog's decision, although the first sample contained a slightly larger percentage of oil, but it also had a percentage more moisture, the analysis working out at: Sample No. 1, oil 65.40 per cent., moisture 4.87 per cent.; sample No. 2, oil 64.21 per cent., moisture 4.69 per cent. In both cases, therefore, the oil content was low; for really good copra, Mr. Bolton tells us, should have 68 to 69 per cent. of oil extractable out of a possible total of 70 per cent. or rather over, whilst the moisture content should be down to 4 per cent., or not above 4.2 per cent. Finally, the award went to the Klanang Estate, Selangor, who therefore were awarded our medal for the best sample of copra.

As already stated, Mr. Ide judged the sisal fibre. In this case, after the elimination of those entries not eligible for competition owing to their being late or not having been cleaned by machinery, the struggle was centred between two bales.

No. 1, a bale of sisal prepared at the Nova Quigia Estate, near Loanda, Portuguese West Africa. (The name of the machine used was not mentioned.)

No. 2, a bale prepared by Mr. Charles Elsee, Fraser-perpet (Sisal) Fibre Plantation, Fraserfurt, Coorg, Southern India, cleaned with a "Tod" machine.

Between these two No. 1 entry was an easy winner on account of extreme length, a good proportion measuring up to 8 ft. and 8 ft. 6 in. in length (Mr. Ide extracted two wisps, and gave them to our Editor to keep in case this statement is challenged), strength of fibre, cleanliness, its even whiteness, and generally attractive and bright appearance. No. 2 sample was strong, but uneven in colour and mostly yellowish. The fact, however, that some wisps of white were mixed in with the yellow showed that had the fibre been retted and cleaned more thoroughly as regards its colour it could have proved a more equal opponent with its competitor as regards colour, but not in length, the average being about 40 in., or rather more, against perhaps an average of 6 ft. 6 in., or even 7 ft. in the other, a fair proportion, as already stated, exceeding 8 ft. The award, therefore, went to Mr. Antonio Guimaraes, the proprietor of the estate, whilst the prize for Robusta coffee went to the Klanang Produce Co., Ltd. The Ceará rubber award has been held back.

The Spraying Competition was not an easy one to decide. Soon after 11 a.m. the competitors moved to the yard outside the building and displayed their machines, explaining the advantages of each, where knapsack sprayers worked by a hand pump were preferable to pneumatic sprayers and *vice versa*. At 12 o'clock the judges were invited to attend, and were

kept continuously at work until 3.30, whilst the report was not ready until past 5 p.m. Those competing, therefore, must have felt that every care and attention had been devoted to the examination and testing of their machines, and that the judges allowed nothing to escape them. This arduous task was undertaken by Mr. R. W. Lyne, Director of Agriculture of Ceylon (after previous experience in the same capacity at Zanzibar) and Mr. W. H. Johnson, who was formerly Director of Agriculture at Aburi, on the Gold Coast, and is now director in Southern Nigeria. The machines were to be judged from the point of view of buyers and users in the Tropics, and that being so, no two better authorities on what was best or most handy could have been found. There was very little to choose between any of the machines shown. After comparing hand-pump knapsack sprayers with those of the pneumatic knapsack type preference was finally given to the latter, as, although as the pressure drops the force of the spray also falls slightly, yet when the winning machine was emptied the judges considered that there was still a useful amount of pressure on right to the end. The ability to use both hands whilst spraying is certainly a great advantage in many cases, and had to be set off against the benefit hand-pumped knapsacks enjoy of being even in action right through or capable of increasing the force of the spray by harder pumping when required. As there had been no entry for the Coir-fibre Competition, the publishers of this journal agreed to give three medals for the spraying machines in order to allow the hand sprayers to be divided into two classes: (1) Knapsack type; (2) machines resting on or worked from the ground, and generally known in the trade as hand spraying machines. The third medal was given, on the recommendation of the judges, to Messrs. W. Weeks and Sons, Ltd., of Maidstone, for easy working power and general "fool proofness" of their power plants, which showed them to be most efficient and suitable for use in the Tropics, especially the one driven by oil. We had much pleasure in carrying out the judges' recommendation and awarding a special medal for Messrs. Weeks's power sprayers, whilst that for the most efficient hand sprayer, worked from the ground, went to the Four Oaks Spray Machine Co., and for knapsack sprayers to Messrs. Weeks and Sons, Ltd., for their pneumatic machine; whilst the same type of machine entered by Messrs. Moellenkamp and Co. ran Messrs. Weeks very close indeed, the judges speaking very well of the easy way it worked, and of the pressure gauge being marked with a red line to show when the pressure needed to be increased. The awards, which were based on the following ten points, carrying ten marks each: (1) Durability; (2) portability and facility of transport; (3) agitation of contents; (4) the pump; (5) the nozzle; (6) the cost; (7) power of spray; (8) fineness of spray; (9) facility to clean; (10) facility to fill and general advantages, were as follows:—

1. Worked by power, Messrs. W. Weeks and Sons, Ltd., Perseverance Works, Maidstone.

2. Hand sprayers, The Four Oaks Spray Machine Co., Ltd., Sutton Coldfield, near Birmingham.

3. Knapsack sprayers, Messrs. W. Weeks and Sons, Ltd., Maidstone.

Messrs. Moellenkamp and Co. and the Four Oaks

Machine Co., Ltd., both gave demonstrations of their powder-spraying machines, which spread a fine dust over a wide area in a very ingenious manner. Mr. Larsdorf's manipulation of the ten-foot powder-spraying tube was certainly very clever, and had there been an award for this class of machine would, in all probability, have secured it for the firm.

Whilst congratulating the winners in each class, we do not forget the other competitors who went to the same trouble and expense to enter their products for competition. In several cases the goods were too late, and this was especially hard when the fault did not lie with those who had borne the cost of their collection and despatch. We only hope that at future exhibitions the number of entries will be much larger. In conclusion, we again beg to thank, on behalf of ourselves as well as of our publishers, each of the judges for the careful and impartial manner in which they carried out the work.

The Social Side of the Tropical Invasion of London.

OPEN DOORS FOR TROPICAL DELEGATES.

AMIDST weather which on some of the days was hot enough to cause the most tropical and energetic member to go "slow," those taking part in the International Congress at the Imperial Institute were glad to avail themselves of London's hospitality and attend the various dinners, receptions, &c., given in honour of the delegates and their friends, all of which were crowded with guests after the work and heat of the day was past.

Earl Beauchamp, on behalf of the Government, issued some 2,000 invitations for Tuesday, June 23rd, the opening day, to a reception (following a dinner to the leading representatives) in the main hall and galleries of the Imperial Institute in honour of the delegates. At the beginning Mrs. Lewis Harcourt, on behalf of the Government, received the guests alone, but later in the evening Mr. Harcourt was also present. The Royal Geographical Society also opened its doors that evening, and invited the delegates to visit their new home at Lowther Lodge, Kensington Gore, where, as at the Imperial Institute, the gardens were illuminated, bands dispensed pleasant music, and the visitors wandered round inspecting the treasures spread around them, and discussing the maps, the products, the plans and dangers, the successes and failures of the various expeditions and commercial undertakings which these treasures and relics called to mind. Meanwhile, old friends met again, and new friendships were formed between those who had known each other for years "on paper." In every way, therefore, the evening of June 23rd was voted a great success, and our best thanks are due to H.M. Government, to Mr. and Mrs. Lewis Harcourt, and to the President, Council, and Fellows of the Royal Geographical Society for providing us with so interesting and pleasant an interval of relaxation after the opening day.

Warm, or shall we say tropical, thanks are due to the President and Council of the Royal Colonial

Institute for the splendid welcome that body also offered to those attending the Congress. This reception took place in the spacious halls and galleries of the National History Museum next to the Imperial Institute and the Victoria and Albert Museum. To this over 8,000 invitations were issued, and a large percentage of those invited must have attended, for the wide spaces and staircases were crowded on all sides and in every room. We were glad to see this, as the size of these gatherings drive home very forcibly the strength of the Royal Colonial Institute, whilst the guests present showed to those experienced in the life and working of our colonial and tropical possessions, the width and depth, as well as the strength, of the net, that the Institute has cast over the world until, as in this case, it seems able to draw together all that is best and most useful to help strengthen the work of the Empire, and to make life generally pleasanter for the Empire builders, leaders and led alike, in all ways. The companionship and mutual self-help that the Fellows of the Institute offer and receive cannot but benefit the Empire and those living in it, in every way, irrespective of race, colour, or creed.

At the final meeting of the Imperial Institute Congress, votes of thanks were passed to the Duke of Bedford for inviting the delegates to inspect His Grace's Experimental Fruit Farm at Woburn, and to Mr. Pickering for accompanying the visitors and explaining to them the special items of interest; the Director of the Experimental Station at Rothamsted was also thanked for his help and courtesy in the same direction; whilst appreciation was expressed to Sir David Prain and the staff at Kew for the facilities they so kindly afforded members of the Congress to visit and inspect the Gardens.

At the Agricultural Hall receptions were given, during the course of the Rubber Exhibition, by the Rubber Growers' Association (Mr. John McEwan, Chairman), the Sao Paulo section, Ceylon, the F.M.S., the French Commissioners, the Soudan section, Guatemala, the Belgian Commissioners, and other countries and sections. We could not, unfortunately, attend all these pleasant gatherings; but to show how they can draw attention to the Tropics, we need only say that over 500 guests attended the Ceylon reception, and that the Rubber Growers' Association sent out over 2,000 invitations, and their reception being held after the exhibition closed at 9 p.m., a large proportion of those invited were able to attend, and agreed that thanks were due to those in charge of the stalls for remaining to a late hour to explain to the guests any points they might choose to raise about the exhibits shown. It might not be out of place here to congratulate the various lady orchestras that played throughout the time that the exhibition was open on their performances, and to Miss Ferrars and Master Eric Brooks for the songs they contributed to an audience divided between discussing the merits of the show and listening to them. In the end it generally seemed that, whilst the song lasted, it received the lion's share of attention.

The West India Committee attracted both quality and quantity to the dinner it gave to the Commissioners for British Guiana, Honduras, and the West Indies, and we afterwards congratulated Mr. Algernon

E. Aspinall, the Secretary of the Committee and editor of the *West India Committee Circular*, on the success of the evening. Quietly arranged without fuss or publicity, it was certainly in proportion to its numbers the most important gathering held during the fortnight, being attended by the following Commissioners: Mr. Alford Nicholls, C.M.G., M.D. (Dominica), Mr. C. Wilgress Anderson, I.S.O. (British Guiana), Hon. W. L. McKinstry (British Honduras), Mr. H. A. Tempany, B.Sc. (Leeward Islands), and Mr. W. N. Sands (St. Vincent and St. Lucia), and also by Sir Ernest Shackleton, whose health was proposed by the Chairman, Sir Owen Philipps (Chairman of the Royal Mail Co. and allied lines), who at the same time wished the intrepid explorer God-speed and a safe return on behalf of himself and those present. We understand that all the sugar and rum for the Shackleton expedition will be supplied by the West Indies. As the foodstuffs for these hazardous journeys are chosen with great care and after everything but the very best and most nourishing have been eliminated, we certainly congratulate the West Indians on being "the chosen people" to supply these two items in this case.

Among those present at the Belgian reception was Sir William Lever; he left, however, as soon as M. Edmond Leplae had delivered his lecture. At the French dinner a gold medal was presented to Mr. Staines Manders by the Commissioners as a token of their appreciation of the manner in which he had organized the exhibition, and at the close of the exhibition Miss Fulton was handed a diamond ring, and received the thanks of all connected with the exhibition for her kindness and help to all concerned.

The Rubber Banquet was held on the evening of Tuesday, July 7th, two days before the exhibition closed, at Princes Restaurant, and was well attended, although we know of many more who would have gladly been present had not their work kept them away or called them out of London altogether. Sir Henry Blake, G.C.M.G., President of the Exhibition, took the chair, and among those who were present and made speeches was Miss Edith Browne, F.R.G.S., well known on account of her books on tropical products and her journeyings in the centres producing them, especially in Ceylon, British Malaya, and the Dutch East Indies, as well as throughout Latin America. Mr. Staines Manders very rightly included a full-page photograph of Miss Browne (facing p. 398) in the official handbook of the Exhibition.

And now we must bid *au revoir* to the subject and those old friends and new ones whom we met and conversed with: Professor de Wildeman, Mdme. and Mdlle. de Wildeman, M. Osterrieth, M. Edmond Leplae, from Brussels; Professor Perrot, M. Emile Baillaud, and M. Cremazy, from France; Dr. Warburg, from Berlin; Mr. Wickham and Mr. Wray, F.M.S.; Dr. Voigt, Hamburg; Professor Carmody, Trinidad; Mr. Grenier, sen., Kuala Lumpur; Mr. Pfaff, of the *India Rubber World*, New York; and Mr. Theodore Smith, of the *Akron India-Rubber Review*; Mr. McCall, Nyasaland; Mr. Tudhope, Gold Coast; Mr. Simpson, Uganda; Mr. Fédtchenko, St. Petersburg; Dr. Heim, Paris; Mr. Ridley; and many others; whilst we shook hands for the first time with Mr. O. W. Barrett, Philippines; Mr. R. N. Lyne, Ceylon; M. Prudhomme, Paris; C. E. S. Baxendale, F.M.S.;

Dr. Van Hall and Dr. Dekker, of Holland; and M. C. L. Gatin, of the *Journal d'Agriculture Tropicale*, one of the French Commissioners, whom we welcomed in place of our old friend, M. Fernand Main, who was unable to be present.

We consider both the Congresses [the first at the Imperial Institute and the second at the Rubber Exhibition] to have been of the utmost importance in helping to advance the science and practice of tropical agriculture, and we heartily congratulate the promoters of them on their successes.

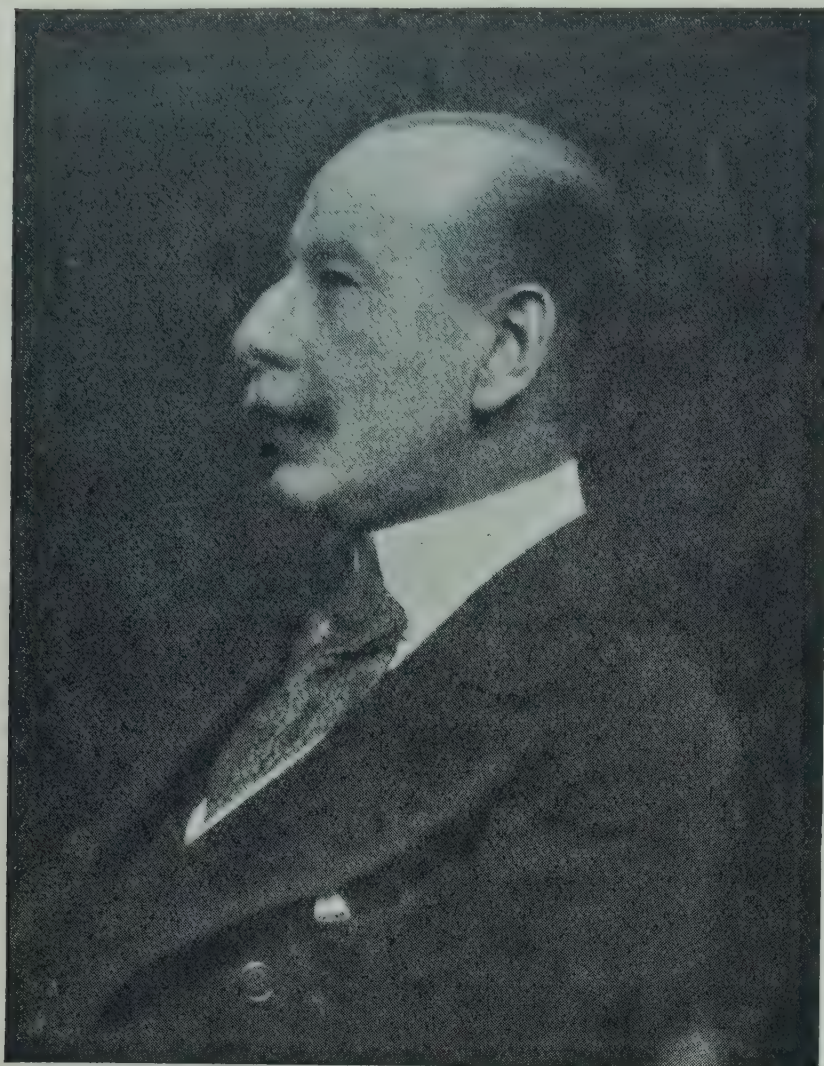
The Liberal Colonial Club.

THE Rt. Hon. H. J. Tennant, M.P., Under-Secretary for War, and Mrs. Tennant, were "At Home" on the evening of July 9th to members of the above club and their friends to whom invitations had been issued to meet Mr. Asquith, who now combines the Premiership with the Ministry for War, and also Lord and Lady Buxton, prior to their departure for South Africa as successors to Lord and Lady Gladstone.

Among those present we noticed Sir Edward Grey (Foreign Secretary), Mr. and Mrs. Lewis Harcourt, Mr. McKinnon Wood (Secretary for Scotland), Sir Owen and Lady Philipps, Lord and Lady Glenconner, Lord Brassey, Sir Norman Lamont, Sir George Paish, the Editor of *TROPICAL LIFE* and Miss Olga Hamel Smith, Lord and Lady Bryce, Lord and Lady Charnwood, Dr. R. O. Moon, Mr. Basil Williams, Sir Alexander and Lady Lawrence, Sir Felix and Lady Schuster, the President of the Board of Education and Mrs. Pease, Sir John Simon (Attorney-General), Lady Emmott, the Under-Secretary for Home Affairs and Mrs. Ellis Griffiths, the Parliamentary Secretary to the Board of Education and Mrs. Trevelyan, Mr. F. D. Acland (Under-Secretary for Foreign Affairs), Mr. Thos. Lough, M.P., Sir John and Lady Madden, Sir Hugh and Lady Clifford, Sir Winthrop and Lady Hackett, Sir Henry and Lady Lucy, and others.

Colonial and tropical politics and items of interest were freely discussed. Sir Norman Lamont expressed his pleasure at the prominent way in which the matter of the establishment of an Agricultural College in the Western Hemisphere had been brought forward and discussed at the Imperial Institute Congress. About this time last year, it may be remembered, Sir Norman started a debate on the subject of Tropical Agricultural Colleges at the "At Home" given by Sir Robert and Lady Perks to the members of the club and those interested in tropical agricultural education. Others were heard discussing the Mexican-American muddle, the Plumage Bill, and other subjects affecting the different dominions, colonies, and dependencies overseas, whose representatives appeared thoroughly to enjoy the opportunity afforded them by Mr. and Mrs. Tennant of exchanging views with their fellow-officials and with the leaders of public opinion in England, and especially at being able to do so under such pleasant conditions.

Previous to the "At Home" many of the members dined together at the House of Commons, and then joined their friends at Mrs. Tennant's, where the guests began to arrive soon after 10 o'clock, and continued to do so until nearly midnight.



"Tropical Life" Friend.—No. 109.

RT. HON. LEWIS HARCOURT, M.P.
Secretary of State for the Colonies.

WE first came into touch with Mr. Harcourt over the election of 1906, when he put up for the Rossendale division of Lancashire. Then, as to-day, he was described as one of the most popular men in the House; we certainly imagine he was one of the most difficult to pick a quarrel with, even when he cannot realize—officially—the crying needs of this country to have at least two agricultural colleges established in the Tropics. In these days, when the unthinking, if not uncultured, democrat is allowed to run rough-shod over and to out-vote those whose wider experience of the world enables them to better realize what it can be made to yield in order to feed our people, including the said unthinking and generally ungrateful democrat, and to supply raw material for our factories, it is a comfort to know that we have a man of "Our Friend's" calibre at the Colonial Office, and we feel that had he gone there in 1905, and started at once to help us build our tropical agricultural colleges, instead of being appointed First Commissioner of Works, to build for His Majesty in London, we might have had both colleges in working order by now, for Mr. Harcourt did not go to the Colonial Office until 1910, where he evidently finds his duties varied, but always strenuous. This is his view of the work, as he told us at the final session of the Congress at the Imperial Institute (see p. 126), when reviewing the work done by his Department: "In these days the Colonial Office has more the attributes of an immense trading and administrative concern than those of

earlier days, when it was a mere machine of government. My days and nights are spent in the study of medicine, in the details of railway construction, with a desire that the smallest sum of money may lay the largest number of miles of track in the fewest possible days. I am a coal and tin miner in Nigeria, a gold miner in Guiana. I seek timber in one colony, oil and nuts in another, cocoa in a third—copra and copal, sisal and hemp, cotton, coffee, tobacco are common objects of my daily care."

Mrs. Harcourt, who acted on behalf of the Government as our hostess when receiving the Tropical Agricultural Delegates at the "At Home" at the Imperial Institute, is the only daughter of the late Mr. W. H. Burns, of New York, who like W. W. Astor, took up his abode on this side of the Herring Pond, at Mymms Park, Hatfield.

As we show on pp. 124-126, "Our Friend" had a busy time between the congresses, the London School of Tropical Medicine and the opening of the Rubber Exhibition, possibly with a little (or a great deal) of Colonial Office and Parliamentary work thrown in; in fact, when we saw him about midnight at the Imperial Institute he was arranging to retire to his house in Berkeley Square for another three or four hours' work, so even "we" have to take off our hat to him for a hard worker.

Our best thanks are due to the Colonial Secretary for allowing us to include him in our now lengthy gallery of friends, and we welcome him doubly as an auspicious sign for the Tropics and colonies generally, as this is our 109th issue, which to those who know us, means the first number of the tenth year of our existence. With so helpful and strenuous a friend, we feel that we shall be the better able to do our share in causing the Tropics to make even more progress in the nine years to come, than they have done in the nine years that have just passed, wonderful as the progress has been during that period. The organized increased output of cotton and rubber, and also of cacao, are but three items to congratulate ourselves on; and now we are working to get more liberal supplies of vegetable oils for soap, butter and "other things." Certainly our tropical dependencies are now one of the most important portions of the Empire, instead of being the least known; we trust, therefore, that the public, *i.e.*, the unthinking, but not unfed democrat, will soon wake up and realize this also. We look to Mr. Harcourt to assist or encourage him to do so by taxing him to pay for the two agricultural colleges in the Eastern and Western Tropics.

The West has promised Mr. Lyne (Director of Agriculture in Ceylon) to help him get his college started in the East. Let us hope it will be ready to open its doors on January 1st, 1916, then give it a year to run and settle down, whilst we watch for mistakes or unlooked-for benefits, then in 1917 we can build our college in Trinidad, W.I., and go "full steam ahead" with that in 1918. Whether Mr. Harcourt will still be Colonial Secretary or Premier by then remains to be seen. Whichever he is, we hope he will make a note of the date and go out West to open the College. No one would meet with a warmer welcome, were they to go, than himself and Mrs. Harcourt, and when the West sets out to welcome friends they do it "right royally."

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1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JULY, 1914.

Tropical Agricultural Colleges.

THE QUESTION OF THEIR ESTABLISHMENT THE LEADING NOTE OF THE THIRD INTERNATIONAL CONGRESS OF AGRONOMISTS HELD IN LONDON FROM JUNE 23RD TO 30TH, 1914.

THOSE who, like ourselves, have been strenuously endeavouring to induce the Government to establish at least two Agricultural Colleges in the tropical zone, say in Ceylon and Trinidad, will feel glad when they receive the published account of the above important Congress that took place at the Imperial Institute under the presidency of Professor Wyndham Dunstan, C.M.G., M.A., LL.D., F.R.S., Director of the Institute, during the last seven days of June. We say this as we believe, thanks to the speeches made by and to the leading men who took a personal interest in the proceedings, that if we still have plenty of work in front of us before we can hope to see the colleges established, that (to some folks) hopeless uphill pull we have hitherto had "all on our own" is now being shared with others, so that if the goal is not yet in sight, it will henceforth be more a matter of diplomacy than hard fighting, and of pulling together, East and West in friendly unison, along a fairly level road, only avoiding pitfalls, rather than the uphill work we have had during the past four or five years. This opinion was considerably strengthened when we were told that the King, who is patron both of the International Congress of Tropical Agriculture as well as of the Rubber Exhibition and Congress, sent the following message of welcome to the delegates gathered together at the Imperial Institute:—

"It is with much pleasure that I welcome to London the delegates of the International Congress of Tropical Agriculture. The importance of their de-

liberations and the number and variety of subjects to be discussed are of especial interest to me. I trust that their discussions will contribute to the advancement of agriculture in the Tropics.—GEORGE, R.I."

Taking the President's speech first, Professor Dunstan in his address of welcome* to the delegates taking part in the Congress very truly said that there was no subject at the present time in the whole field of human activity which demanded greater attention than the organization of those agencies which made for the agricultural productivity of the tropical regions of the world. The subject was of importance to the native races of the tropics, who were coming more and more under European control and influence, and who looked to the example of European knowledge and experience for guidance in increasing the productivity of the soil. It was of no less importance to all Governments of tropical countries. Moreover the temperate world has to depend on the tropics for the supply of numerous materials which have become necessities of life and the basis of some of the most important manufacturing industries of modern times. With these remarks we cordially agree, because we believe that the best, and in fact, the only way to help the natives to help themselves is to train up white planters, managers and Government experts to go out and plant and make their estate pay well, for once the native, be he in the East or West, sees that the new-fangled ideas have wisdom in them, *i.e.*, that they give bigger profits, he will then follow the example set and proved by practical results, whilst he will not budge an inch when the teaching is only by theory. "With this material progress made of late years," Professor Dunstan went on to say, "had come, somewhat slowly, the recognition of the fact that tropical agriculture was an applied science, and the reflection that progress would have been more rapid and less costly had it been effected more generally under that enlightened direction which depends on the considered application of scientific principles. No one who had studied this question in its many aspects could doubt that a great need existed for the establishment within the British tropics of at least one agricultural college, properly equipped with all the facilities for instruction and research in the several branches of tropical agriculture. The college should be Imperial in its educational character and open to properly qualified candidates from all parts of the Empire without distinction of race, and whilst having close relations with Government Departments of Agriculture in the country in which it is established, should, as an educational institution, be separately organized under the management of a board on which all agricultural interests were represented." (Hear, hear, and applause.)

A remark of Professor Dunstan that it "cannot be doubted that well-trained men with the diploma of a

* Delivered, be it remembered, before such men as Lord Emmott (Under Secretary for the Colonies), Lord Sudeley, Sir George Reid (High Commissioner for Australia), Sir Sydney Olivier (ex-Governor of Jamaica and now Permanent Secretary to our Board of Agriculture), Sir Horace Plunkett, Sir Hugh Clifford (Governor of the Gold Coast), Sir H. Hesketh Bell (Governor of the Leeward Islands), Sir Henry Blake, Sir George Denton, Sir Frank Swettenham, Sir Frederic M. Hodgson, Sir James Wilson, Sir William Schlich, the Hon. Gideon Murray (Administrator of St. Vincent), Sir E. Rosling, Mr. Arno Schmidt (International Federation of Cotton Spinners), Mr. J. Arthur Hutton (Chairman of the British Cotton Growing Association), Mr. Wilson Fox (British South Africa Company), and others.

(tropical agricultural) college will readily find remunerative employment," still points to the idea that the bulk of the students would train to work under others. Besides the above the class of men we also want to see come as students, and who we believe will frequent the colleges, east and west, when established, are those who mean to plant for themselves either alone or in pairs. These are the men we want to see spread over the Tropics, and they are just the class of men that are *not* going at present in such numbers as the requirements of this country call for. The reason for their not doing so is, we believe, due to this being an age of cold reasoning, and lack of initiative compared to what prevailed fifty, a hundred, or a hundred and fifty years ago, when men did not look before they leapt; and though their temerity cost some of them their lives, in the aggregate the results exceeded all expectations, and it is to these bold spirits we owe our present-day prosperity and supplies of food and raw materials. To-day those who might go out to plant, not only look where they are going but take a telescope and microscope to examine the soil, and would like to ask the Government or some one to indemnify them against loss if they come to grief. Since it is no use kicking against the pricks, and since people will be cautious and are no longer willing to risk their money, health or lives, we must let them see ahead where their way tends, and how best to get to their destination with the least risk—in fact with none at all. The father wants to know that the son will not "go slack" whilst learning his profession; and the son, if about to invest his own patrimony, wants to make sure that he is going the right way to work. Both, therefore, we take it, need agricultural colleges to help them, and until we get the colleges such men will not send their sons, nor go out themselves to plant. Those who wish to train to work under others will form class two, then there will be Government officials and consulting experts, whilst America, Germany, Belgium, and other countries all promise us students, whose presence we should welcome, for the same as we like to see young Englishmen go to foreign colleges, in the same way we must welcome their sons to ours. Once established, therefore, no doubt need exist that the colleges, the *two* or more colleges, will be well patronized, and that the benefits they will confer on the Empire will be immense.

The question of technical education in the tropics was given first place in the deliberations of the Congress, and was represented by the following papers, all except the second and last being read:—

Mr. G. C. Dudgeon, Consulting Agriculturist, Ministry of Agriculture, Egypt, "Technical Education in Tropical Agriculture." This paper, in the unfortunate absence of Mr. Dudgeon through illness, was read by Mr. Gough, of the same department.

Dr. Francis Watts, C.M.G., Imperial Commissioner of Agriculture for the West Indies, "Agricultural Education and its adjustment to the needs of the students."

Dr. Gino Bartolommei Gioli, Direttore del Istituto Agricolo Coloniale Italiano; "Gli Studi di Agricoltura Coloniale in Italia."

M. Edm. Leplae, Professor at the University of Louvain and Director-General of Agriculture, Colonial Office, Brussels, "Elementary Agricultural Schools for Natives in the Belgian Congo."

Mr. H. Hamel Smith, Editor of TROPICAL LIFE, "The

necessity of establishing a British Tropical Agricultural College in the Western Hemisphere."

Mr. W. H. Patterson, Government Entomologist, Gold Coast, "Agricultural Education in the Gold Coast."

Those taking part in the discussion included Mr. Lyne, Director of Agriculture in Ceylon, who told us what they were doing in that island as regards plans, a site, &c., and then Professor Carmody, Director in Trinidad, who went one better, saying that not only had they plans, site, &c., but had the building ready and waiting for the staff to instruct the students as soon as the money is forthcoming to pay the professors, &c. Referring to the abstract of the paper prepared by our Editor, we are glad to say that the £500,000 spoken of as being necessary to establish a college in Ceylon is now said to be a mistake, it should have been only one-tenth that amount, viz., £50,000. On hearing this we rewrote our paper and went back to our own figures. "As I wrote to the *Times*, on April 14th of last year," urged our Editor, "ten per cent. of the cost of a Dreadnought, which would, from all accounts, amount to £2,250,000, would supply ample funds for two fully equipped colleges at £100,000 each, three at £75,000 each, or four at £55,000."

In order to dispel any idea that the West may be antagonistic to the East having the first college, instead of being, on the contrary, willing to assist the East to get hers first, we call attention to the following portion of our Editor's paper. This paragraph came immediately after the opening one explaining why he had chosen the question of agricultural colleges in the Tropics as the subject of his debate, and in it he told the Congress:—

"Before I go on to say one word in support, not so much of the claims of the West Indies for an agricultural college, as to show the absolute necessity of this country, if it means to enjoy that share to which it is entitled of the ever-increasing commerce of Latin-America, to establish such a college in the Western Hemisphere, I want it to be clearly understood that I am not urging the claim of the West Indies in competition with Ceylon, for such is in no wise my desire. On the contrary, if, *pro tem.*, there is to be only one college, then I agree that Ceylon should have it."*

We were glad to see that the Congress generally and our paper in particular received prominent notice in the Press, and it is this which leads us to hope that we have reached the brow of the hill leading to success, and so can look forward to an easier time before us. The *Financier* discussed Professor Dunstan's address very fully, and gave striking headlines to the "Proposed Establishment of Colleges." The *Financial Times* gave our paper two half columns next to the big headlines reporting the opening of the Rubber Exhibition. "Mr. Hamel Smith dwelt strongly on the necessity of establishing a British Agricultural College in the Western Hemisphere," was the comment of the *Daily Telegraph*, whilst the *Morning Post*, the *Financial News* and other leading newspapers all gave prominence to

* Visitors to the Rubber Exhibition may also have noticed that on the tables in the Ceylon Court were reproductions of the cartoon we published in our issue of March, 1913, in which our Editor is urging John Bull to try the nut-crackers, and offering him a pair marked Ceylon Agricultural College, the others marked West Indian College still being left on the table. Ceylon supporters of the movement recognized in this our willingness to let them come first.

the plea for tropical agricultural colleges, and seemed pleased that the matter was being so influentially supported.

The (1914) Rubber Exhibition.

OPENING BY PRINCE ARTHUR OF CONNAUGHT.

MR. AND MRS. LEWIS HARCOURT PRESENT.

THE Fourth International Rubber Exhibition was duly declared open on the afternoon of Wednesday, June 24th, by H.R.H. Prince Arthur of Connaught before a crowded audience—among whom was Mr. Victor Hamel Smith, representing TROPICAL LIFE, our Editor being engaged at the Congress at the Imperial Institute—in the now historical tennis court in the Gilbey Hall leading out of the main Agricultural Hall. Sir Henry Blake, as President, took the chair, and on his right sat the Prince and Mrs. Lewis Harcourt, whilst on his left were Mr. Harcourt and Mr. John McEwan, Chairman of the Rubber Growers' Association. Prince Arthur made a most appropriate speech, in the course of which he told us that "It is important for the welfare of mankind that men should meet together from time to time for the promotion of those branches of industry to which they are devoting their brains and lives." Mr. Harcourt, who followed, assured those present that he felt "a deep and official interest in the rubber production of the British Empire. It is an industry which practically only began with the present century, but its growth in that time has been exceptionally rapid."

Want of space, as can be seen, prevents our including in this issue our report on the important sections contained in this Exhibition. We do, it is true, start our "Ramble Round Raw Rubber," but cannot conclude it, whilst we are unable to discuss such items as:—

- (1) Tropical Machinery at the (1914) Exhibition.
- (2) Cacao.
- (3) Coco-nuts and Vegetable Oils.
- (4) Our Editor's paper on "The Manuring of Rubber." This was well received and fully discussed.
- (5) The Rubber Curing Machine of the Future, and the class of rubber to be made for export as suggested by the (1914) Exhibition.
- (6) Sisal and other Fibres and their Preparation.
- (7) The Rising Popularity of Spraying Machines and Fluids.

On these and other subjects we have made copious notes, and, but for the extreme importance to tropical development generally of the articles included in this issue, we should have discussed this month the "Manuring of Rubber" and "Tropical Machinery," if nothing else; both of these, however, will appear in the August issue. Meanwhile, the London correspondents of the *Singapore Free Press* and other leading Eastern papers borrowed our paper on the "Manuring of Rubber," and tell us that they have done full justice to it in the reports sent East, so readers of TROPICAL LIFE out that way who are interested in the subject, and what good rubber planter (or tea planter, for we discussed tea as well) is not, will no doubt have already learnt our views on the tendency to plant wide and manure "to taste" accord-

ing to the requirements of each field or even particular patch of trees, and *not* spread it broadcast, as with a general mixture guaranteed, like a patent medicine, to cure all ills. We particularly urge attention to experimental work with a view of inducing the roots to go down in order to protect the trees against drought and the danger of being blown down.

We should like to say one word about the tennis court which was made by our old friends, The Leyland and Birmingham Rubber Co., Ltd. This was undoubtedly, from the point of view of the public, "the draw" of the fortnight. The first rubber tennis court we understand that has ever been laid it was deservedly noted and criticized. Another time we would suggest, if the makers are to receive the full benefit of so costly an advertisement, that the unconverted, viz., the press, should be encouraged to play upon it and test it, rather than the converted in the shape of those connected with the rubber trade, who monopolised it to such an extent that no working journalist could properly try it and report upon it to those unable to be present. We were fortunate enough to secure a game against Mr. Killick, the rubber editor of the *Financier*, but the Press Tournament that was arranged and advertised fell through owing to the impossible times given us during which to play. Those, therefore, who wish to secure the maximum of publicity for the court when the next one is laid, should see that the press has more chances of playing.

After our experience, speaking briefly, we should say:—

(1) That the colour of the rubber must be a dark green, not a pale washed-out colour as this one was, and which caused us to have difficulty to see the balls. We suggest dark green, but others might prefer red or other colour.

(2) The balls seemed to fall dead straight and not twist, even when the "wickedest screw" was applied to them by the striker.

(3) A good grass tennis court is preferable, but not a worn-out, badly-kept one.

(4) Made over a slightly springy wood flooring, either at home or in the Tropics and protected from the sun and rain, such a court, we should imagine, would be preferable to the bare earth, cement, rubble, or even asphalt, although we have a great liking for a good asphalt court outside the Tropics. With a cement foundation under the tiling, however, as at the Agricultural Hall, we prefer asphalt for over here.

(5) The question of cost has to be considered. This court, we understand, was very expensive. On this account we feel it useless to suggest that thicker tiling be used than the $\frac{3}{4}$ in. tiles at the Exhibition.

(6) The tiles were 18 in. square. Since there is always a tendency for them, if they shrink or turn up at all, to do so at the edges, it might be preferable to use long sheets, or tiles of 30 in. or 36 in. square, and so minimize the "coast lines" where trouble tends to arise. This, however, is a technical matter, which the manufacturer can best judge. The tiles, of course, are carefully solutioned to the ground as well as to each other.

The experimental court was, as already stated, much appreciated, and our thanks are due to the Leyland and Birmingham Co. for the pleasure so many of us enjoyed at their expense.

Rambles Round Raw Rubber.

FOR the third time we have the pleasure of jotting down our impressions of "What's What" in the Rubber World as exemplified at the Fourth International Rubber Exhibition, the third one to be held in London. Compared with its predecessors the present exhibition, judging the plantation industry by the exhibits, shows that the Ceylon output is either in the form of pale or light blanket, with the scrap put up in the same form, or else as smoked, and therefore dark diamond-rolled sheet of short length, preferably in short even lengths, but at times in long strips. Crêpe was scarcely seen at all, but the diamond sheet when too thin and in long strips still presented the same disadvantages of the piles of crêpe of old, viz., of sticking more or less tightly together in a way that gave trouble to those sampling it, causing one to wish to make sure that no dirt or stones were inside, and generally detracting from the attractiveness and value of the parcel. To avoid these drawbacks, therefore, we still, as with the 1911 exhibition, favour the thick "nobbly" blankets, as preserving the "nerve" and "pull" of the rubber, of showing its quality off to advantage, and of being fairly economical as regards space in packing, whilst at the same time its uneven surface allows the necessary ventilation and prevents the sheets from sticking. For these reasons we prefer blanket to diamond or spiral-rolled sheet, thick or thin. The Malay exhibit, on the other hand, showed a firm unwavering belief in crêpe and nothing else, unless the rubber is smoked, and then it is, the same as Ceylon, put up in diamond-rolled sheets of varying thickness. Discussing their choice of crêpe over blanket with Mr. Wray and the others in charge of the stall, they said that although the crêpe certainly did stick, and stick hard, this was not detrimental, and that it sold well. The objection to blanket was that it cost more, it was not necessary, and above all it gave the rubber a second and more severe milling than the crêpeing did. Malaya therefore, is not a believer in blanket, and so showed their "first latex" as pale thin crêpe, whilst their scrap was in a similar form only dark, and the balance was devoted to dark smoked sheet. An interesting item in their stand was a complete series of exhibits showing the collection and preparation of the latex from the "tree to the factory." There were seen tapping knives, cups, latex trays, white rubber, and finally, the finished article. Such an object lesson was meant to attract attention, and it certainly did.

The great lesson that this exhibition has to teach us is the uncertainty and the groping for information that is apparent to arrive definitely at *the* system for curing rubber whether with the help of washing and roller machines, or by smoke or other curing only. On all sides one saw a marked evidence of this, and the absence of the big engineers from the building suggested to our minds that they also find it difficult during the present interregnum to know what to advise to those clients who, when laying down machinery, naturally want something that will hold its own for at least five years, and not have to be scrapped in twelve or twenty months time as being out of date or only capable of turning out rubber of inferior attractiveness compared to more advanced methods. Feeling that, under the circumstances, it was best to be silent by

absence was probably the real cause why modern machinery was conspicuous (with one exception in the English section) by its absence, and this being so, it will be useful for all interested in rubber production and preparation for market to remember what machinery was included in 1911, what processes were exhibited this year either by the machines themselves or by samples prepared by means of them; and then, when the next rubber exhibition is held in two or three years' time, be it in England, America, France, Germany or Belgium, to then note in what direction ideas tend to move, and whether it will be the iron machine or the smoking curing process that is scrapped, or both, to make way for a still more favourable method that has not yet suggested itself.

With these ideas generated in our somewhat bewildered brain* we set forth for our ramble among the exhibits of raw rubber, with which the Agricultural Hall was beset on all sides. As regards actual weight, we should say that 1914 equalled, if it did not excel 1911 or 1908, for though we missed Southern India, Mexico, the Netherlands, the Mabira Forest, &c., Malaya had a very full range of counters, whilst its total was considerably larger than on previous occasions.

We started in Brazil, *viâ* the stand of the Municipality of Itaituba (State of Pará), where we discussed the 150 and more samples of woods (see later under heading of "Tropical Tours in Town"), and then passed on to the exhibits of Uricuri (*Attalea excelsa*), Inajá (*Maximiliana regia*) and other nuts used as fuel, on account of the properties they possess when smoking the rubber. The Inajá, Mr. Mendes (the inventor of the "Drum" process) says, gives the thickest and best smoke, but is less common than the Uricuri and so less often used. Passing the case of extracted oils and the piles of Brazil nuts, either loose or in their *ourigos* or pods, we came to the case of cigars, and then to the pyramid of cacao beans, evenly bright red in outward appearance and more attractive than those generally offered for sale in London. Surrounding all these were piles of rubber pelles of all shapes and sizes. Situated, as Itaituba is, on the banks of the Tapajos River, it is, needless to say, very proud of its rubber, which it claims is of the best. Their stall included piled-up samples of paddle lumps, one with the paddle still in it, small pelles, Caucho strings, Xingu coarse, dry Island fine, dry Cajary fine, Tapajos coarse, Cameta coarse, &c., the whole forming an instructive and interesting exhibit, alike for the student of economic botany as well as for the manufacturer or engineer. On the table in the centre of the stall were the short thickish sheets (deeply indented with the exporter's brand or mark, which it takes from the drum over which the latex revolves) prepared by the "Drum" or "Mendes" process, which we discuss elsewhere. It is, as described, a drum-smoking process, without the aid of any other ingredients but those in the smoke, and certainly the rubber shown as cured by it had excellent nerve and was attractive in appearance. In this section, had he been alive, we should have encountered Dr. Jacques Huber, and could not help again express-

* Due entirely, we beg to state, to our anxiety to give the inventors or supporters of each of the many processes a fair hearing and to try and realize (not always successfully) from the dozen or more individual descriptions why their one was *the* process that will, or should, supersede all the others.

ing our regrets to Mr. Mendes and Dr. Braga that he was no longer with us. He was, however, represented by the valuable collection of rubber seeds and cuttings of the various species of the *Hevea* family, twenty-two or twenty-five in all, that he brought together, and which, the seeds at any rate, attracted much attention in 1911. Leaving Pará, we entered the Amazonas section with the more weighty pelles turned out by the estrada owners of the Solimoes Valley and along the Rio Acré; next to these was some up-river Caucho or "Peruvian" ball, Madeira "knapsacks" or paddle pelles, sheet rubber from the valley of the Jurna River, pelles and Caucho from the Madeira region and strings from the Rio Negro, rubber by "the ton" *aux choix* surrounded us on all sides. He who was not satisfied with one or the other must indeed be hard to please.

Then we shipped East, and, as is only possible in Mr. Manders's exhibitions, in two seconds we found ourselves talking to Mr. Lyne in Ceylon under an hospitable Singhalese roof and surrounded by walls "papered" with alternate strips of dark and pale blanket sheets from Pallagodde, Bentota, Mariawatte, Gampola, Kepitigalla and other estates, whilst out in the open, like wisteria in Japan, hung, suspended from the lofty roof, long festoons of blanket Crêpe, pleasant to look at, graceful and valuable, a marked contrast to the black "pelles" across the opening. Passing through the pavilion and turning to the left we thought for the moment that we were again in Brazil, for we suddenly found ourselves surrounded with "lumps" of rubber, varying in shape, but of that well-known appearance and smell that one associates with Latin America, we, however, found that the samples were only those cured by the various modern processes now met with on all sides. The Mendes, Cerquiere Pinto, or Da Costa in Brazil, Byrne and Wickham in London, and by the Agar, Reid-Till, Golledge, Colombo Commercial, and Pitiakande, &c., in Ceylon, rubber prepared by one or other of these processes were distributed throughout the Hall in rolls, sheets, block, or other shapes, according to the fancy or convenience of the curer or the machine used. The merits or demerits of each we cannot discuss here, but, *en passant*, we must congratulate and thank Mr. Lyne and those in charge of the Ceylon exhibit for the way in which samples cured by all these processes were shown side by side on the same counter, including a Brazilian pelle cut in half, for those visiting the exhibition to learn about, and having done that to compare and discuss. With Mr. Wickham, Mr. Ryan, Mr. Lyne, Mr. Mendes, Mr. Byrne and Mr. Elsworthy, of the Tyneside Engineering Co., who make the machine for the Agar process, the patent being vested in a firm in Ceylon, as well as supporters of the Golledge and other systems, each describing the different processes, one can learn quite a lot about coagulation and anti-coagulation curing if they are "brainy" enough to retain all that is told them, which, we fear, was not altogether the case with ourselves, hence our reticence in discussing them in print.

From Gikiyanakande Estate, of which he is the manager, Mr. Golledge sends a ball of rubber smoke cured like an Amazon pelle, only, we understand, two poles are used, one at each end, instead of one long one thrust right through the ball; the advantage claimed being the avoidance of the aperture that pene-

trates the Brazilian pelle. The dissected balls, for on the Ceylon stand there is, as already stated, one from Brazil for comparison, show Mr. Golledge's to be made up of a number of skins or layers fairly even in thickness or thinness, compared with the uneven layers of the Brazilian rubber, and the colour of the Ceylon ball is more brown, due to the exuding of moisture of that colour from between the layers. The cut sample of Wickham cure, taken, we understand, from Peradeniya trees 7 or 8 years old, certainly compared well in tensile strength and in that silky appearance, when stretched across a strong thumb-nail, that the Amazonas possesses, and, like its Western rival, the Ceylon rubber, although the thinnest of skins, did not break.

Except the "lump" or ball samples described, the whole of the Ceylon exhibits were practically composed of "blanket," darker scrap or pale "firsts," or diamond-smoked, and hence dark sheets in short, thicker lengths or long strips. A sample of pale "worms" sheet was there, and also a block of scrap from Pitiakande Estate, Kurunegala, which attracted more than average attention from those who criticize the present method of worrying and tearing the rubber when washing and crêping it. Such critics brought others to come and admire the block, the rubber of which they declared to be the best in the show, and, they advocated, so long as the planters can "keep the bark and dirt away, that this is the rubber to send over, its nerve, texture and strength is perfect, we want no better rubber." Such comments on the top of the discussions we had just been having regarding the advantages of the various "curing processes" certainly deserve attention, for here is rubber being greatly praised that has undergone no "process" at all, beyond that supplied by Nature, who coagulated it on the tree itself. Except with Ceará, the idea of collecting your rubber as scrap would be impossible, but the comments given above are worthy of note, especially at the present moment, when we are all searching for the best method of preparing the latex. They certainly tell in favour of those who, as mentioned in "Unbiased's" letter last month, decry "the harm done to rubber by over-milling."

Since Malaya is only distant from Ceylon (at the Rubber Exhibition) the thickness of the partition, we soon found ourselves in the centre of products coming from the territories directed by Mr. Lewton-Brain, as head of the Agricultural Department in the Federated Malay States, and Mr. Burkill lower down in the Straits Settlements. Among such congenial surroundings we shook hands with Mr. Wray, the Commissioner-in-Charge of the exhibits, and expressed our pleasure at having him with us for the third time, or the fourth if the Exposition in New York is included, and then proceeded to examine the model of a rubber estate house, kitchen, servants' quarters and factory, beautifully made to scale by Mr. A. H. Alston, Civil Engineer of Kuala Lumpur. The facility with which entire roofs were removed to show the placing of the rooms, the machinery, &c., was surprising, whilst those visitors who gathered round the table with us listening to Mr. Wray's explanation all praised the neatness of the work, and the care bestowed on making the houses so exactly to scale, the placing of the latex tanks, trollies and machinery being specially admired.

(To be continued.)

Cotton.

THE following were the prices for Cotton in London on July 10th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1913.		Compare Good, 1912.	
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	per lb.
Surat kinds *	4 $\frac{7}{8}$	to 5 $\frac{1}{8}$	5 $\frac{1}{8}$	to 5 $\frac{1}{8}$	5 $\frac{3}{8}$	to 6 $\frac{1}{8}$	—	5 $\frac{3}{4}$	to 5 $\frac{1}{2}$	5 $\frac{1}{8}$ to 6 $\frac{1}{8}$	—
Madras ...	5 $\frac{1}{8}$	to 5 $\frac{1}{8}$	5 $\frac{1}{4}$	to 6 $\frac{1}{8}$	—	—	—	5 $\frac{5}{8}$	to 6 $\frac{5}{8}$	5 $\frac{3}{8}$ to 6 $\frac{3}{8}$	—
Bengal ...	—	—	4 $\frac{3}{8}$	—	4 $\frac{7}{8}$	—	4 $\frac{9}{8}$	5 $\frac{3}{8}$	—	5 $\frac{9}{8}$	—
Assam ...	—	—	5	—	5 $\frac{3}{8}$	—	5 $\frac{5}{8}$	5 $\frac{7}{8}$	—	6	—
China ...	—	—	5 $\frac{1}{4}$	—	5 $\frac{1}{8}$	—	5 $\frac{7}{8}$	5 $\frac{5}{8}$	—	6	—
West Indian ...	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{3}{4}$	7 $\frac{1}{2}$	—	7 $\frac{3}{4}$	—
Sea Island ...	10 $\frac{1}{2}$	—	13	—	16	—	19	15	—	14	—
West African ...	6 $\frac{1}{8}$	—	7 $\frac{3}{8}$	—	7 $\frac{9}{8}$	—	—	6 $\frac{1}{2}$	—	7 $\frac{1}{8}$	—
East „ ...	7 $\frac{7}{8}$	—	8 $\frac{1}{4}$	—	10	—	—	7 $\frac{9}{8}$	—	7 $\frac{5}{8}$	—

* Liverpool quotations.

During the week ending July 11th the market has moved within moderate limits, and closes at an average loss of 9 points for near positions, which have been affected by heavy tenders in Liverpool against July contracts. Distant months have only gone back about 3 points, and there is a steady feeling at the close, although beneficial rains are reported from many parts of the cotton-growing belt, and advices from manufacturing districts are not encouraging. East Indian is fully $\frac{1}{8}$ d. lower.

The import into Liverpool this week amounts to 18,641 bales, since September 1st 4,502,579, same week last year 6,545, last year's total 4,466,338 bales. The estimated Sales amount to 30,000 bales, including "called." Middling American is quoted at 7·36d. per lb., last year 6·76d., 1912, 7·09d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight ...	14,319,000	13,610,000	15,589,000	bales
Exports from United States since September 1st—				
To Great Britain ...	3,358,000	3,502,000	4,165,000	—
To Continent, &c. ...	4,989,000	4,423,000	5,564,000	—
Total crop ...	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	July 10th.	Same time 1913.	Same time 1912.	
	d.	d.	d.	per lb.
July ...	7·09 $\frac{1}{2}$	6·48 $\frac{1}{2}$	6·85 $\frac{1}{2}$	—
July—August ...	7·09 $\frac{1}{2}$	6·48	6·85	—
August—Sept. ...	6·89 $\frac{1}{2}$	6·40 $\frac{1}{2}$	6·80 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

SUPPLIES recently have shown some falling off in quantity; the demand has been rather slow, but values generally are unchanged. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on July 1st show a decrease for the month of 192,000 bags, against a decrease of 180,000 bags last year. The visible supplies show a decrease of 327,000 bags, against a decrease of 290,000 bags in 1913. There have been slight fluctuations in the market for "futures," and at the close the tone is rather better, September Santos closing at an advance of 6d. for the week. We quote :—

	To-day	July 2nd, 1914
London ... Santos, Sept. del. ...	43s. 1 $\frac{1}{2}$ d. ...	42s. 7 $\frac{1}{2}$ d.
New York ... No. 7, Rio „ ...	8.56 cents ...	8.55 cents
Hamburg ... Santos „ ...	48 $\frac{1}{4}$ pf. ...	47 $\frac{3}{4}$ pf.
Havre ... Santos „ ...	60 $\frac{1}{4}$ francs ...	59 $\frac{1}{2}$ francs

The receipts at Rio and Santos for the crop season 1913-14 were 13,816,000 bags, against 11,485,000 bags and 12,464,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India, viz.—Mysore, 60s. 6d. for smalls, 64s. 6d. for second size, 69s. 6d. for bold. Coorg, 64s. for second size, 69s. for bold, 50s. to 52s. 6d. for cherry pickings. Neilgherry, &c., 58s. to 65s. 6d. for

smalls, 66s. 6d. to 73s. for low middling to middling, 71s. to 78s. 6d. for bold, 86s. to 91s. for Marogogipe. Nelliampathy, 69s. for medium, 73s. 6d. for bold. Travancore, 68s. for smalls, 71s. for middling, 74s. to 78s. for bold. Wynaad, 60s. for small, 67s. for medium, 72s. for bold. Naidoobatum, 61s. 6d. to 66s. 6d. for smalls, 69s. to 73s. for low middling to middling, 75s. to 75s. 6d. for bold.

Uganda.—At 58s. for smalls, 67s. for medium, 72s. 6d. for bold.

Jamaica.—At 65s. for fine ordinary.

Costa Rica.—At 69s. 6d. to 71s. 6d. for smalls, 67s. 6d. to 81s. 6d. for fine ordinary to good middling, 78s. 6d. to 88s. for good middling to fine bold.

Guatemala.—At 54s. to 58s. 6d. for smalls, 54s. to 73s. for ordinary to good middling, 72s. to 77s. 6d. for bold.

Nicaragua.—At 55s. 6d. to 58s. for foxy green, 83s. for good bold.

Salvador.—At 60s. to 62s. for good ordinary, 90s. 6d. for Marogogipe.

Vera Paz.—At 56s. to 70s. for ordinary to good smalls, 74s. to 80s. for middling to good middling, 82s. to 90s. for middling to fine bold, 100s. for Marogogipe.

Mexican.—At 50s. to 51s. for ordinary, 72s. for good middling, 77s. to 77s. 6d. for bold.

Colombian, &c.—At 64s. to 68s. for fine ordinary to low middling, 71s. to 83s. 6d. for middling to fine bold.

Coco-nut Products, &c.

ACCORDING to Messrs. Mordaunt Bros., June closed with but little business in Coco-nut oil, although sellers seemed firm, and this was continued during the first week in July, when shippers did not offer freely on the one hand, or buyers show any inclination to operate on the other. On July 11th sellers were offering to drop their price 10s. per ton (6d. cwt.), but up to the time of going to press buyers were still indifferent to offers and keeping aloof of the market. As a result of this Cochin Oil moved down from 41s. 6d. on June 27th to 41s. on July 11th, and Ceylon from 36s. 9d. to 37s. down to 36s. only, whilst pressed oil has moved from 34s. or 34s. 6d. to 33s. Palm kernel oil after being steady for a fortnight went slightly lower, being quoted at 35s. against 36s., the rate previously.

Following on this, July 11th found prices as follows:—

<i>Palm oil (Liverpool):</i> 1914		1913	1912
Per cwt.			
Lagos ...	29s. 6d. to 30s. 0d.	32s. 6d. to 32s. 9d.	28s. 9d. to 30s.
Benin ...	27s. 6d.	30s. 3d. to 30s. 6d.	27s. 3d.
Congo ...	24s. to 24s. 6d.	26s. 9d. to 27s. 3d.	26s. 9d.
Bleached ...	30s. 6d. to 31s.	34s. to 35s. 6d.	30s. 6d. to 31s. 6d.
Clarified ...	28s.	30s. to 31s.	27s. 6d. to 28s.
<i>Palm kernel oil</i>	35s. 9d.	45s. 3d. to 47s.	35s. 6d. to 38s.
<i>Coco-nut oil:</i>			
Cochin ...	50s.	54s.	43s. 6d.
Ceylon ...	40s.	48s.	38s.
English pressed	34s.	None	34s. 6d. to 35s.
<i>Copra oil:</i>			
Ceylon ...	None	None	38s. 6d. to 39s.
Cochin ...	42s. 6d.	50s. 6d.	41s. 3d. to 42s.

The *Times of Ceylon* just to hand calls attention to the heavy increase in the exports of copra from that island, viz., 23,171 tons from January 1st to June 15th against 13,781 tons during the same period last year, 9,512 tons in 1912, and 6,781 tons in 1911. That this increase has not been obtained at the expense of other coco-nut products can be seen by the following table taken from the *Ceylon Observer*, in which, be it noted, the copra shipments now extend to June 22nd.

Export of Coco-nuts and Coco-nut Products from Ceylon:—

	1914.	1913.	1912.	1911.
Coco-nut oil ...	9,743	7,520	5,745	7,926 tons.
Copra ...	24,223	15,089	9,612	7,359 „
Desiccated Coco-nut	7,155	4,495	4,520	5,106 „
Coco-nut poonac	4,497	2,947	2,371	2,656 „
Coco-nuts ...	6,727,363	4,939,402	5,136,129	7,604,329 nuts.

According to the *Public Ledger*, prices on July 11th were:—

Soya Oil.—Oriental (in cases) afloat, £24 c.i.f.; June-July, £24 10s. c.i.f.; July-August, £24 17s. 6d. c.i.f.; August-September, £25 c.i.f. Antwerp.

Coco-nut Oil firm. Ceylon spot, £39; June-July, £36 5s. c.i.f.; July-August, £36 5s. c.i.f. Cochin spot, £50; August-October, £41 c.i.f.

China Wood Oil.—London spot, £28 10s.; July-August, £25 15s. c.i.f.

Palm Oil.—Lagos on spot, £31 10s.

Palm Kernel Oil.—July-Dec., £35 f.o.b. Hamburg.

Soya Oil Beans steady. Parcels spot, £8 6s. 3d.; afloat, £8 7s. 6d.; July-August, £8 8s. 9d.; August-September, £8 10s. Hull.

Linseed Cakes.—London made, £7 15s. to £8.

Cotton Cakes.—London made, £4 17s. 6d. to £5.

Copra steady. Malabar, August-October, £26 5s. buyers Hamburg. Ceylon, June-July, £25 5s. buyers Hamburg. Java, July-September, £24 8s. 9d. buyers. August-October, £24 10s., and October-December, £24 15s. paid Holland, Hamburg and Bremen. Macassar, July-September, £24 5s. buyers Holland, Hamburg and Bremen. Singapore, July-August, £24 8s. 9d. buyers Hamburg. Cebu, July-August, £24 5s. buyers Antwerp. South Sea Island, June-July, £24 2s. 6d. buyers London. F.M. Straits, June-July, £24 5s. buyers, and July-August, £24 5s. Marseilles. Manila, July-September, £23 12s. 6d. buyers, and October-December, £23 15s. Marseilles. Mixed no Padang, June-July, £23 13s. 9d. buyers, and July-September, £23 13s. 9d. Marseilles, all c.f. and i. delivered weight.

As regards coco-nut oil, Messrs. Goodlake and Nutter report that there has been a little more demand, especially for distant positions, but considerably under prices at which shippers are inclined to take. There are sellers at 36s. 6d. to 36s. 9d. for Ceylon September-October, with buyers at 35s. 9d. to 36s. Afloat oil, however, has been offering at 35s. 10½d. without finding a buyer. We fear, with the present state of the market, near-at-hand stuff will be at a considerable discount on forward. Cochin oil: The market still remains very inactive, and we quote 40s. 6d. September-November shipment. Palm Kernel Oil: There have been very free sellers up to the end of the year at 35s. For January-June there have been sellers at £35 2s. 6d., and buyers at £35 f.o.b. Hamburg. Pressed Oil is inactive. We quote 34s. 4½d. to 34s. 6d. September-December in Ceylon casks, and for prompt oil 34s. 3d. f.a.s. London. Spot Prices: Ceylon Oil, £38 to £42; Cochin Oil, £48 to £52.

The India-rubber Market.

UP at Liverpool the Pará market has been steady during the week, but closes slightly firmer, and the values are: Hard fine spot and July-August, 2s. 9¾d.; August-September, 2s. 10d.; soft fine July-August, 2s. 3¾d.; scrappy negroheads, 1s. 7¼d.; Peruvian ball spot, 1s. 7d.; and September-October, 1s. 7¼d. per lb. Medium Brazilian grades have again been neglected. The African market has been idle all the week, and no sales have been reported.

In London the market for plantation has been moving in very narrow limits, and has shown a slightly easier tendency, with more steadiness, however, towards the close, and some improvement in price with Standard Crêpe around 2s. 1¾d. to 2s. 2d. per lb., and smoked sheet at 2s. 3¼d. or 2s. 3½d. With Hard Fine sellers have been few, and the price lately has increased 1d. per lb., with 2s. 10½d. as the spot price.

According to Messrs. S. Figgis and Co.'s report on the auctions on July 7th-9th, the market previous to the sales had declined, but with a considerable business in forward delivery for Plantation Rubber it closed steadier with Pará grades rather dearer. At the auctions 1,032 tons Eastern plantation kinds sold with good competition at about ½d. per lb. under the close of last sales, except for Smoked Sheet, which was dearer. Quotations, therefore, include Standard Crêpe at

2s. 1 $\frac{3}{4}$ d. to 2s. 2d. Ribbed Smoked Sheet, 2s. 3d. to 2s. 3 $\frac{1}{4}$ d., against hard fine Pará, 2s. 10d.; soft fine, 2s. 3 $\frac{1}{4}$ d.; and Caucho Ball, 1s. 7 $\frac{1}{4}$ d.

Prices realized at the sales include Plantation Malaya (877 tons): Crêpe, Standard Latex, thin and thick, 2s. 1 $\frac{1}{2}$ d. to 2s. 2 $\frac{1}{4}$ d.; stained and streaky palish, 2s. 0 $\frac{3}{4}$ d. to 2s. 1 $\frac{3}{4}$ d.; light brown and grey, part streaky, 2s. 0 $\frac{1}{4}$ d. to 2s. 1 $\frac{1}{4}$ d.; fair to good clean brown, 1s. 10 $\frac{1}{2}$ d. to 2s. 0 $\frac{1}{2}$ d.; dark and specky brown, 1s. 7 $\frac{3}{4}$ d. to 1s. 10 $\frac{3}{4}$ d.; dark and black, part pressed, 1s. 7 $\frac{1}{4}$ d. and 1s. 10d.; dark and black, inferior, 1s. 3 $\frac{1}{2}$ d. to 1s. 6d.; dark to good smoked, 1s. 8d. to 2s. 0 $\frac{3}{4}$ d.; cured by "Byrne" Process, dark to good (Sheet, 2s. 3 $\frac{1}{4}$ d.), 1s. 8d. to 2s. 1 $\frac{3}{4}$ d. Sheets, standard smoked (Highlands 2s. 3 $\frac{3}{4}$ d. to 2s. 4 $\frac{1}{4}$ d.), 2s. 2d. to 2s. 3 $\frac{3}{4}$ d.; damp, mouldy, and part smoked, 2s. to 2s. 2 $\frac{3}{4}$ d.; fair to fine unsmoked, 2s. 1 $\frac{1}{2}$ d. to 2s. 2 $\frac{1}{4}$ d.; damp, mouldy and stuck, 1s. 11 $\frac{1}{2}$ d. to 2s. 1 $\frac{1}{4}$ d. Block, pale Lanadron, 2s. 3 $\frac{1}{2}$ d. to 2s. 3 $\frac{3}{4}$ d. Scrap and Virgin, fair to good, 1s. 7 $\frac{1}{4}$ d. to 1s. 8 $\frac{1}{2}$ d.; mixed and inferior, 1s. 2 $\frac{3}{4}$ d. to 1s. 5 $\frac{1}{2}$ d.

Ceylon (155 tons): Crepe, standard Latex, thin and thick (very fine 2s. 2 $\frac{1}{2}$ d. to 2s. 2 $\frac{3}{4}$ d.), 2s. 1 $\frac{1}{2}$ d. to 2s. 2 $\frac{1}{4}$ d.; streaky and stained palish, 2s. 0 $\frac{3}{4}$ d. to 2s. 1 $\frac{3}{4}$ d.; light brown and grey, part streaky, 2s. 0 $\frac{1}{4}$ d. to 2s. 1 $\frac{1}{4}$ d.; fair to good clean brown, 1s. 10 $\frac{1}{2}$ d. to 2s. 0 $\frac{1}{2}$ d.; dark and specky brown, 1s. 8d. to 1s. 10 $\frac{3}{4}$ d.; dark and black, part pressed, 1s. 7 $\frac{1}{4}$ d. to 1s. 9 $\frac{1}{2}$ d.; smoked dark, 1s. 8d. to 1s. 10d. Sheets, standard smoked, 2s. 2d. to 2s. 3 $\frac{1}{2}$ d.; damp, mouldy, and part smoked, 2s. 1d. to 2s. 2 $\frac{1}{2}$ d. Sheets and Biscuits, fair to fine unsmoked, 2s. 2d. to 2s. 2 $\frac{1}{4}$ d.; damp, mouldy and stuck, 2s. to 2s. 1 $\frac{3}{4}$ d. Scrap and Cuttings, fair to fine, 1s. 7 $\frac{1}{4}$ d. to 1s. 9 $\frac{1}{2}$ d.; mixed and inferior, 1s. 2 $\frac{1}{2}$ d. to 1s. 5d.

The market for Plantation since the auctions has been fully steady, with a moderate business passing. Standard Quality No. 1 Crêpe, 2s. 2 $\frac{1}{4}$ d. for spot; July delivery sold at 2s. 2 $\frac{1}{8}$ d. and buyers. Smoked Sheet (ribbed) spot, 2s. 3 $\frac{1}{4}$ d. value, with July at 2s. 3d.

Pará continues firm at the recent advance. Hard fine on the spot closing at 2s. 10 $\frac{1}{2}$ d. buyers; July-August, 2s. 10 $\frac{1}{2}$ d.; September-October, 2s. 11d. Soft fine steady, July-August and August-September delivery, 2s. 4 $\frac{1}{4}$ d. Manaos Scrappy, July-August delivery, 1s. 8d. sellers. Caucho Ball firm, July-August and August-September delivery, 1s. 8d. sellers.

According to Dr. J. C. Willis, formerly of Ceylon and now at Rio, the bumper cotton crop in Brazil will tend to reduce their coming season's output of rubber, as many of these seringueros, especially from the State of Ceará, will not need to go rubber-tapping for the pay it brings in, but will remain at home amidst pleasanter and less strenuous surroundings.

Pará Rubber statistics for the month of June (tons):—

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará	1,150	900	= 2,050	agst. 2,100	2,570	1,720
Shipments to Europe	510	400	= 910	„ 1,040	1,870	1,320
„ „ America	400	70	= 470	„ 810	1,170	920

Crop statistics June 30th, 1913 to June 30th, 1914 (12 months):—

	Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10
Pará {	1913-14	29,330	9,800	39,130	41,950	39,360	37,500
Receipts {	1912-13	32,290	9,660	39,130	41,950	39,360	37,500
„ Shipmts. Europe	15,080	5,190	20,270	23,770	20,260	19,910	21,860
„ „ America	14,350	4,170	18,520	19,530	20,570	13,570	17,040

Sugar.

COPIOUS rains in all beet-growing countries and lower quotations from America have been reflected on our market, reported Messrs. Czarnikow, Ltd., on July 9th, and caused a good many realizations of August commitments with a decline of about 1 $\frac{3}{4}$ d. for both old and new crop deliveries. With sufficient rain the complaints about insects naturally diminish, though in some districts they are still in evidence; on the whole, however, there is no doubt that crop appearances everywhere are quite promising; still, producers at present continue their reserve, which is probably accounted for by the moderate price as well as by the fact that they were able some time ago to market a good deal of their production at much higher and remunerative prices. Our Board of Trade figures for the month of June show a slightly improved position; at the same time it must be admitted that the demand for foreign sugars remains decidedly unsatisfactory, and business with consumers exceedingly slow. The Indian demand has again ceased for the moment, doubtless owing to Java refusing to meet it unless at higher prices; the Java crop is said to be a little late as compared with last season.

The American market declining to 3.26 cents for immediate and 3.32 for August shipment, with a very dull tendency, is rather disappointing, as it would indicate that the trade in refined at present is not coming up to expectations. With satisfactory fruit crops a revival ought to be looked for, and holders of preferential sugars should be able to realize prices nearer to the world's values, even if non-preferential sugars are not wanted for late autumn meltings, as to which it is too early to form any definite opinion.

The American market has been quiet in tone, and without much support from buyers; the quotation for 96 per cent. Centrifugals has receded from 3.32 to 3.26 cents = 10s. 5 $\frac{1}{4}$ d. c.i.f. New York. In the United Kingdom business in cane sugar has not been active. Parcels of refining grades near at hand have sold at fully steady rates. Grocery Crystallized is slow of sale, but values of fine grades are well maintained. As regards cane-producing countries there is no special feature to report. The total transactions of British West India amount to only about 2,000 bags, and include Crystallized Demerara, low middling greyish yellow, 12s. 9d. duty paid; middling pale, 13s.; good ditto, 13s. 3d.; good yellow, 14s. to 14s. 6d.; fine yellow, 15s. 4 $\frac{1}{2}$ d. to 15s. 9d.; Syrups, middling soft yellow, 11s. 3d. Crystallized Trinidad, middling pale, 13s. Crystallized St. Lucia, middling pale, 13s. Crystallized St. Kitts, middling yellow, 13s. 1,087 bags Crystallized Surinam sold, low greyish yellow to middling ditto, 12s. 9d. to 13s.; also 125 bags strong brown and yellowish Syrups at 11s. 3d. to 11s. 9d., duty paid. Later on some Crystallized Demerara sold at 14s. 4 $\frac{1}{2}$ d. to 14s. 7 $\frac{1}{2}$ d. for fine, and good yellow St. Lucia at 13s. to 13s. 3d.

Up in Liverpool 300 to 400 tons grainy Peruvian, shortly due, have been dealt in at 10s. 2 $\frac{1}{4}$ d. floating, landing, basis 96 per cent.; 325 tons Syrup, at 8s. 3d. floating, landing Clyde, basis 89 per cent. polarization, and 700 to 800 bags Syrups on quay, at 8s. 7 $\frac{1}{2}$ d. to 8s. 9d. telquel.

The London Cocoa Market.

By THE EDITOR.

As can be gathered elsewhere, the greater part of the time since I last sent in a report has been spent in listening to planters and experts discussing the production and preparation of tropical crops, and among these the question of the fermentation and non-fermentation of cacao has not been the least important and interesting. Mr. W. H. Johnson, who used to be the Director of Agriculture on the Gold Coast, and now occupies the same position in South Nigeria, has proved that by means of a rotary dryer the beans can be cured and dried without fermenting at all, and that the drying occupies only a day and a half. If such a method were universally adopted, therefore, the saving in time and the independence of the planter over the weather would be assured, so I expect soon to see such a process extending on all sides, as to do in thirty-six or forty-eight hours what at present takes the best part of a week, and to do it whether the weather is wet or dry, means much to the planter in these days of hustle and lower costs. Should the estate owner, however, wish to ferment his cocoa for three or four days, then the subsequent drying can be done in nine hours, and excellent samples of such cocoa were shown on the Southern Nigeria stand, presided over by Mr. Johnson, as Commissioner. Leaving Nigeria for the French Colonies, I found M. Perrot, the Commissioner for that section, whose idea of steaming the fresh beans instead of fermenting has attracted attention and caused considerable controversy since our "Fermentation of Cacao" was published. Surrounded by his bottles of specimens, M. Perrot showed me one filled with powder made from beans prepared by his process, and claimed that it had a fuller aroma and better flavour than from fermented cocoa. The beans are put on shelves, two or three beans thick, as in a vacuum chamber, but instead of exhausting the air steam is introduced under slight pressure; and the beans are left in that for some hours, then taken out, washed and dried as usual. Besides the better flavour and aroma the great advantage M. Perrot claims for his process is greater uniformity in the output of the estate using it.

Little or no news of transactions in Guayaquils are published, although the output continues to be more than substantial. I give the twelve months' output, where possible, as well as those for the half year, and leave it to my readers' imagination to realize what the total for 1914 will amount to if the July-December output bears the same comparison to the January-June exports, as they have done in the previous years given, especially last year:—

<i>Guayaquil Output.</i>	<i>Jan.—June</i>	<i>Jan.—Dec.</i>
1914 ...	652,600 ...	— qtls.
1913 ...	325,300 ...	854,300 "
1912 ...	484,200 ...	729,300 "
1911 ...	446,300 ...	804,500 "
1910 ...	376,400 ...	748,500 "

The first item that struck me in the usual market gossip was the heavy stock of cocoa (315,031 bags) lying at Havre. The French sellers, however, do not appear very concerned over it, and seem to think that manufacturers' requirements will take the cocoa off

their hands in due course without any great pressure or breaking away in values. The great increase in stocks during June was due to the heavy landings of Venezuelan (20,646 landed against 6,276 delivered), and, in a lesser degree, of Trinidads (8,672 landed, and 2,643 delivered). Accra kinds, on the other hand, were all but invisible as regards receipts, against some 10,000 bags delivered, say:—

<i>Havre Stock, June 30th—</i>	1914 Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Pará ...	16,708	69 to 75	14,439	82 to 86
Bahia ...	19,541	63 „ 74	10,949	81 „ 86
Venezuela ...	71,505	85 „ 200	57,157	90 „ 185
Trinidad ...	47,231	64 „ 69	26,480	87 „ 90
Grenada and O.W.I.	3,721	62 „ 68	3,200	79 „ 87
San Thomé ...	6,250	72 „ 75	5,085	86 „ 88
San Domingo ...	3,982	62 „ 66	4,061	75 „ 80
Haiti ...	14,917	55 „ 75	6,935	70 „ 82
Accra kinds ...	80,691	64 „ 68	56,487	77 „ 80
Guayaquil... ..	39,476	68 „ 76	17,569	90 „ 96
Other kinds ...	11,009	—	12,624	—
Totals ...	315,031 bags		214,986 bags	

Against this the London stocks on July 11th were:—

<i>London Stock, July 11th—</i>	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads ...	10,614	10,362	6,941
Grenadas ...	11,891	7,809	5,059
Other W.I. ...	5,472	4,080	9,194
British Africa ...	13,367	11,452	8,181
Portuguese Africa	3,930	4,764	4,670
German Africa ...	2,718	4,013	7,002
Ceylon and Java ...	8,992	18,401	16,545
Guayaquil ...	28,301	12,158	41,723
Brazil and Bahia	2,230	604	2,455
Other Foreign ...	12,439	7,747	7,284
Totals ...	99,954	81,390	109,066

As regards production, the island of Trinidad should establish a substantial record this year as regards her output, for up to June 20th she had already exported 282,443 bags, against 241,294 bags in 1909-10, the present record crop which finally totalled 293,886 bags, or very little short of 300,000. This year's crop ought surely to exceed 325,000 bags at least. Grenada, on the other hand, will be well behind her record year, and although Trinidad has made the loudest complaints about a three years' drought, it has been Grenada, I fear, that has, in proportion, suffered the most, as from October 1st to June 20th she has only shipped 63,456 bags, against 58,378 bags last year, and 66,978 in 1912.

Whilst accumulations at Havre have mounted up the stock at Lisbon fell substantially during June, as, according to Messrs. Martin Weinstein and Co., they stand as follows:—

	Bags
Stock at Lisbon on May 31st ...	85,519
Landed in June ...	9,453
Gives ...	94,972
Less delivered in June ...	32,052
Leaves stock on June 30th, 1914 ...	62,920
Against „ „ 1913 ...	62,488
„ „ „ 1912 ...	95,022

Coming to the consumption in the United Kingdom our Board of Trade figures for last month show that in June only 2,220 tons were delivered for home

consumption, against 1,832 last year, and 1,830 in 1912, making the six months' movements total as under:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (June 30th) Tons.
Jan.-June, 1912—	18,993	13,592	2,972	11,930
„ 1913—	20,072	14,279	3,832	10,700
„ 1914—	25,335	15,615	3,633	16,020
Incr. 5,263	Incr. 1,336	Decr. 199	Incr. 5,320	

Foreign Manufactured—	June only Landed.	Del'd H.C.	Jan.—June. Landed.	Del'd H.C.
1914 ...	975	929	5,297	5,272 tons
1913 ...	803	725	5,897	5,640 „
1912 ...	628	606	4,415	4,587 „

Liverpool during the month has not showed itself to have had a very active market, and the latest news speaks of the market as being dull and inactive. The last sales reported included about 1,000 Accra kinds at 47s. to 50s., showing that, as regards value, that centre remains unchanged.

No sales took place in London on June 7th, and, including the auctions on June 14th, values rule about the following:—

Trinidads.—Good to fine marks have been sold at 60s. and 61s., good middling red, 59s.

Grenadas.—Good to fine marks, 55s. to 56s.; good red, 53s. 6d. to 54s. 6d.; ordinary unfermented to good fair fermented, 50s. to 52s. 6d.

Jamaicas.—Have been selling well, realizing full prices and changing hands readily. Fine marks at 57s. to 58s. 6d.; fair reddish, down to 54s.

Dominicas.—Have been selling at 53s. to 54s. for good red, and 55s. for fine, whilst ordinary unfermented sold down to 50s.

St. Lucias.—The cheaper grades have not been selling, but good fermented changed hands at 54s. 6d. to 55s. 6d.

Puerto Cabello.—Good bold realized 85s.; fair clayed, 75s.

British Honduras.—Fair reddish sold at 53s.

Samoa.—Fair boldish realized 70s.; good bold, 76s.

Java.—Good boldish realized 80s.

Bahia.—Superior is quoted at a premium compared to “fair,” the latter, I believe, still being uncertain as to output. On London landed terms Superior might be worth about 59s., against 57s. or 58s., the top price for Cameroons, 56s. or 57s. for San Thomé, and, perhaps, 49s. to 51s. for Accra kinds or San Domingo sorts.

Ceylons.—Fair to good medium estate sold at 75s. to 80s.; of other kinds I have no news.

Since writing the above I have heard that about 1,000 Guayaquils have changed hands, including Caraquez and Balao at 55s., and 55s. 6d., and Arriba at 56s. 6d. to 58s. Fine Arriba is worth between 60s. and 62s. At the sales on July 14 Jamaicas again attracted most attention and sold up to 57s. 6d. for good red. Not enough Trinidads or Grenadas were sold to make a market. Fine St. Lucia realised 56s., and good red Costa Ricas 56s. to 57s., whilst up to 90s. was paid for fine Ceylons, and 79s. for bold Samoa. The market generally is quietly steady, but prices are not likely to go higher with the hot weather we are having and the holiday season ahead.

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LONDON: JOHN MURRAY.

Why and How the War will Benefit the Trade of the Empire.

SOME of our contemporaries are, we hear, cutting down the size of their papers, or suspending publication altogether, either on account of the advertisements falling off or because they have run out of paper. Neither of these causes has affected us, and, so far as it is in our power to do so, TROPICAL LIFE will spare no expense to appear regularly in order to continue to take the names of leading firms here to leading buyers overseas. The only thing that can stop us will be a shortage of pulp, but even if the country runs short we believe now that we have sufficient paper to keep TROPICAL LIFE going at full speed for a good many months to come, and we have no doubt that our contemporaries in the Tropics and Colonies will do the same. We refer to such papers as the leading Indian, Ceylon, and Malayan papers, or to the *Tropical Agriculturist*, of Ceylon, the pioneer of all the Anglo-tropical journals; *Grenier's Rubber News*, of Kuala Lumpur; *Queensland Agricultural Journal*, Brisbane; *Fiji Planters' Gazette*; our old friend *Le Journal d'Agriculture Tropicale*, of Paris; *Le Bulletin de l'Association des Planteurs de Caoutchouc*, of Antwerp; or the *West Indian Committee Circular*, which latter circulates where planters, in face of the present rise in the price of sugar, should surely have plenty of cash to spend, especially as they cannot go to Paris just now to spend it, as many like to do. Then, again, many of the bulletins and journals of the various agricultural societies, government experimental stations, &c., receive advertisements, all of whom, as with TROPICAL LIFE, are willing and anxious, knowing what a time is here and ahead of us for orders (to go either to England or America) since Europe is closed,* to do all they can to bring buyer and seller, exporter and importer,

* "How long can we expect supplies of foodstuffs to be maintained?" asked the representative of the *Westminster Gazette* of Mr. J. G. Broodbank, a Board of Trade representative to the Port of London Authority. "Indefinitely," Mr. Broodbank insisted. "All British ports, and especially London, are bound to have a large accession of business, since the Continental ports are no longer open. At first many ships on the way home from ocean ports will be diverted to London, as no other Continental ports are available to them. Ships which carry cargoes partly for London and partly for Antwerp and Hamburg are already discharging their entire cargoes here. There must be a large tonnage of shipping on the way to Hamburg and Bremen just now laden with food, as Germany is rapidly becoming as dependent upon foreign food as we are; and they will all have to come into London, or other British ports." And as it is with imports, so it will be with orders for goods to be sent back in return. All these orders must either come to this country or go to America; the Continent cannot attend to them, nor will it be able to do so for weeks, and perhaps months and years, to come.

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together, and so make at least one silver (and gold) gleam of satisfaction against the very black clouds all round us. We have had over twenty-five years' experience in merchants' and traders' offices, both here and in the Tropics, and know exactly the shiploads of enamelware, china, earthenware, glass, lamps, and thousands of other household and estate supplies, as well as machinery of all kinds that went out regularly from the Continent, all of which could just as well and far better have gone from here. The cost may be a little higher, but the quality is far superior, and since the freight, charges and insurance, and all the expenses of transport up country on the other side are the same on the cheap rubbish (which often arrived leaking and broken) as on the fair-priced and strong, useful articles that were made to last, even in the Tropics, a benefit out of all this evil may still accrue to British makers if this war eliminates the trade in cheap rubbish, and substitutes well-made articles that will last a fair time and still cost reasonable prices.

We appeal, therefore, to engineers, manufacturers, and traders generally not to pull back on account of the war, but to press forward more vigorously than ever, whether they advertise with us or with our competitors, or even if they do not advertise at all. We trust that they will make hay whilst the sun shines in the Tropics if not over here, and take this heaven-sent chance to place out British goods of British quality on the African Continent, Latin America, South Seas, Asia, Malaya, &c., where we fear hitherto they have not been as prominent a feature in the shops and stores overseas as we should have liked them to be. In doing so they will help the Empire, keep their workpeople and staff going, and also help themselves at the same time.

This is "Great Britain's opportunity," the London *Evening News* told us a few days after we had circularized English manufacturers on the matter, because:—

"Germany has supplied Argentina with 23 per cent. of her imports in spare parts of machinery, 40 per cent. of her imported electric wire cables, 51 per cent. of her galvanized wire, 41 per cent. of her jewellery, 74 per cent. of her dynamos and electric motors, 27 per cent. of her spare parts of carriages and automobiles, 34 per cent. of her tramway material, 61 per cent. of her household utensils, 49 per cent. of her glassware, and 26 per cent. of her copper manufactures."

If this is so with a single Republic, and the one, too, in which this country has the largest stake, what must the total German trade be throughout Latin America generally? It is contended, and we believe rightly, that the German houses have handled business on terms that neither English nor American firms can entertain, and that they have done it with bills drawn on London houses and discounted in Paris, and so gambled with our money and pushed us out of markets, because by financing them we enabled them to do so. Hence the forty millions of German bills one hears so much about. We do not profess to know anything about finance, but if there is any truth in the above statements, then it is for this country and France to apply the remedy in future, and we cannot believe they will not do so. The South American trade, we know from personal experience, has been done (on the

surface) at half price for years back, and we have many friends who have had to leave it alone as English wages, &c., make our costs exceed those of the Continental houses. We have heard the trade described as kite-flying, and those who flew the kites have now cut the string, and we have lost our property. Maybe we shall regain it; when we do so it is to be hoped that the kite-flying will be done by our own countrymen and not aliens. If we are going to risk our money and lose some of it, let us lose it to our own people, not to unfriendly competitors.

The first portion of these notes was issued by our Editor as a leaflet to the leading firms, Chambers of Commerce, and the Press of this country. It brought back a fair number of answers agreeing with the statements, and stating, as a rule, that the writers were already taking steps to push out in those centres where the absence of German competition leaves a void. "But whilst we do not believe in growing rich at other peoples' cost through quoting impossibly low prices," they add, "we hope other firms, when the boom does come, will not, on the other hand, lose their heads and ask prices that are too high."

The Practice of Cacao Fermentation.

By W. M. MALINS-SMITH (Grenada).

(Continued from p. 123.)

PART VI.

ALL the essayists who have contributed to that valuable addition to our cacao literature "The Fermentation of Cacao,"* agree that there are two distinct processes, (1) the external, and (2) the internal fermentation. The external fermentation process is, briefly, as follows: the yeast cells in the saccharine juice produce alcohol and carbon dioxide; bacteria next change the alcohol into acetic acid and cause a rise of temperature which kills the cells of the seed and also the slime tissue. This process causes the easy removal of the mucilage, the coloration of the outside of the seed, and the destruction of the germ inside the seed.

The internal fermentation process begins after the third day and after the germ has been killed by the rising of the temperature to 110° F. This process brings about the changes in the seed upon which the aroma, flavour, &c., of the finished product are entirely dependent, and may be briefly summed up, according to Dr. Oscar Loew, as follows: "The cells of the seed being killed by the rise of temperature, the oxydizing enzymes are liberated and cause the brown discoloration." Dr. Sack goes further and states: "After the death of the germ has taken place the substances within the bean itself commence working upon each other, . . . and, at the same time, an ethereal oil is formed." All investigators seem to agree as to the process of the external fermentation; but they do not all agree as to the causes of the internal fermentation. It would appear that the theory of the enzymes residing in the interior of the seed being responsible for the changes which take place is the one most clearly demonstrated.

* Edited by H. Hamel-Smith. Price 11s. Post free. TROPICAL LIFE Publishing Department.

The action of the fly (*Drosophila melanogaster*) and of the ferment *Saccharomyces theobromæ* is most interesting to practical planters. Another very interesting feature of the book is the oxidation theory of Dr. Schulte im Hofe. The most interesting fact, I think, is with regard to the properties of cacao-oil, which by the way is not mentioned by Dr. Nicholls although he gives a list of every other constituent of the cured seeds.

Turning to the practical portion of this work, it seems that Mr. Hudson's conclusive methods are almost exactly the same as those generally in vogue in Grenada on the best estates. Although he has not given us anything new that is of real practical value, yet his essay is of immense value as a work of reference. His system of slate-lined boxes is, according to his own discussion on them, not an economic proposition, for he says that this material is unsuitable for sliding partitions and that sliding partitions are indispensable to economic working of the sweating-house. Concrete sweating boxes, lined and unlined with boards, are commonly used in Grenada, but these cause the same inconvenience as the slate would and entails an enormous amount of labour in "shifting." Plain smooth 2 in. thick white pine planks for sides and bottoms fixed in 4 in. by 4 in. pitch-pine frames make the cheapest and most efficient sweating boxes. These can be made with the bottoms and sides fitting in grooves so that but few nails are used, and these only in the frame. A series of six or eight of these boxes can be taken to pieces, cleaned thoroughly, and remounted by one labourer in a couple of hours.

The following are the mean temperatures I obtained over a series of trials some time ago:—

Cacao in sweating boxes, each 5 ft. by 5 ft. by 4 ft. containing 100 cubic feet.

After 24 hours	90° F.	After 120 hours	120° F.
" 48 "	95° F.	" 144 "	123° F.
" 72 "	107° F.	" 168 "	123° F.
" 96 "	117° F.		

These temperatures were obtained in the centre of the mass. It will be observed by comparison with Mr. Hudson's essay that these figures were obtained with a considerably larger bulk of cacao than he used, his largest bulk being only 32 per cent. of mine.

There is one fact that stands out prominently in the whole book, and it is that, as far as is known at present, fermentation cannot alter the peculiar quality of the commoner grades, say, calabacillo cacao and improve it to the value and quality of say, criollo, or *vice versa*. Any improvement along these lines can only be attained, I believe, through cultural methods.

It would seem that the slow oxidation process of drying, outlined by some of the essayists, has a good lot to recommend it, but with the reservation that it must be worked out to fit in with economy in buildings and in handling. According to all the essayists, with one exception, rapid drying is not supposed to be consistent with the finest finished product.

The following drying process, occupying three days or seventy-two hours, has given very good results, and is recommended to the consideration of planters:—

First day out.—Nine hours in the sun-drying trays exposed to as much sunlight as can be obtained. Then closed for the night under cover in layers of about 3 in. deep.

Second day out.—Ten hours in a tray machine in

layers of 1½ in. with a current of hot air at a temperature of 125° F. to 135° F. Then closed up in the machine for the night at a temperature of about 90° F.

Third day out.—Polished and returned to the tray machine for about eight hours in a current of hot air of not more than 130° F., and allowed to remain in the trays overnight in a temperature of 90° F. Bagging next morning at the end of seventy-two hours. This system of drying may in rainy seasons give some amount of mouldiness or mildew during the first twenty-four hours, but this is entirely removed by the polishing process later on.

The Commercial Side of the (1914) Rubber and Tropical Exhibition.

TROPICAL MACHINERY AND ESTATE SUPPLIES.

A POINT that we, and others, have always noted and fully appreciated in connection with all the exhibitions arranged and run under the direction of Mr. Staines Manders, has been the fact that they have always been ready, and in full working order, when the doors are opened to the public. We only wish other managers could claim as much, as punctuality in these short exhibitions means so much both to exhibitors and visitors alike. This year was no exception, and we noted with much pleasure and profit that it closed an hour earlier, viz., at 9 instead of 10 p.m. This was a great step in the right direction; no one lost by it and many gained.

Although the large rubber engineers were absent, there was still much to be learnt about the most up-to-date methods for preparing the rubber for market. Elsewhere in this issue we publish a second letter by "Unbiased" regarding the possibility of an improved modification of the Amazonas method superseding the old-fashioned mangle and wringer process made use of when the plantation rubber industry first started. As our correspondent very truly says, the remarks being made by the general manager of one of the leading manufacturing firms are of the weightiest kind, and no planter can afford to ignore them. With this letter in our pocket just before the close of the exhibition, we paid special attention to the different firms who exhibited methods for preparing the rubber for market by means which avoid that excessive milling that Mr. Lyne in Ceylon warns us against, and to avoid which Mr. Alexander-Johnson, of the North British Rubber Co., Ltd., "earnestly recommends all planters to look carefully into the washing of their rubber."

Before going on to the exhibits themselves, we must say a word to call attention to the encyclopædic handbook or catalogue issued by Mr. Manders in connection with the exhibition. Like many of the fruits, &c., on the stall-counters of the Potash Syndicate, it has developed and grown to a wondrous, almost to an appalling size, now weighing 4½ lb., against but a few ounces for the catalogue of the first exhibition in 1908. It now costs 5s., postage extra, and those who did not secure a copy at the exhibition will find it worth buying still, for it contains over 1,000 pages of information, and the very latest planting news by such authorities as Dr. Malcolm Watson on "Diseases in the Tropics," H. R. Carter* on "The Decortication

of Fibrous Plants," "Evaluation of Crude Rubber" by Dr. Schidrowitz, "Future Possibilities of Rubber," "The Philippine Rubber Question," by O. W. Barrett, "Plantation Rubber from a Manufacturer's Point of View" by W. A. Williams, and other articles on rubber by M. V. Cayla, Messrs. H. K. Rutherford, Loch, Lewton-Brain, E. L. Killick, Cyril Baxendale (on Standardization), Dr. Joseph Torrey, Herr Springer, and M. Edmond Leplae, so you get 4½ lb. of paper filled with information by such authorities as those quoted above, all for the modest sum of 5s., exclusive of postage, which with wrappers should be 1s. 6d., or at most 1s. 9d.

Coming now to the exhibits, we were glad to see that the well-made and low-costing hand-machines of Messrs. Summerscales met, during the whole time the exhibition was open, a considerable amount of attention from visitors, especially as The Byrne Rubber Curing Machine was close by, and many who were interested in this method of preparing the rubber were discussing, we noticed, a Summerscale machine for passing the rubber through after it had been treated. On calling at Messrs. Summerscales stand, we found the London manager, who is a director of the firm, Mr. H. S. Longsdon, and Mr. Oldham, the City representative, discussing the first letter by "Unbiased," published in our June issue, where that correspondent quotes leading authorities against over-milling their rubber. "That's a complaint," urged Mr. Longsdon, "that no one can charge against us. There is nothing in our machines to tear and spoil the texture or nerve of the rubber." Of the nine or ten makes of machines that this firm had on their stand, the "Trojan," "Sirius," "Iris," and "Mars" seemed to attract the most notice, and the firm, we understand, did quite a good business in these, especially in the "Sirius" machine, which is a type of machine that has been and is still in great demand. In reply to our query when saying good-bye at the close, Messrs. Summerscales told us that they were pleased with the results of the exhibition, and extremely glad that they had agreed to exhibit, for it had brought them into touch with many planters in centres other than the Federated Malay States and Ceylon, where they are already well known, and as a result they had gone away with a good lot of inquiries to follow up and orders to execute. Turning then to discuss the "Byrne" process for curing rubber with Mr. Whyte, Secretary of the company, he told us that the attention they had received exceeded their anticipations. Examining the samples of rubber treated by their process, Mr. Whyte explained how the "Byrne" process assures standardization of the rubber, which is the great thing everyone is now urging planters to see after, or the bulk of the planters themselves are trying to secure. Listening to the conversations of the visitors, it seems that compared to other methods the "Byrne" process offers a considerable saving as regards cost of buildings and their upkeep, and offers several advantages in the thorough manner in which it antisepticizes the product, thereby preventing it from decomposition, deterioration, or mould formation, whilst it offers a

rapid and cheap means of preparing the rubber, any quantity being treated, according to the size of the shed, in three hours at a cost of about ½ d. per lb., i.e., 20 lb. of rubber for 1d., or a ton for 9s. 4d. This being so, we were not surprised to see so many visitors gathered round Mr. Byrne or Mr. Whyte whilst we sat in the Sao Paulo lounge and sipped their delicious beverage, "the best and cheapest on the market," since it certainly was excellent and there was no charge. In King George's Hall Mr. Ugarté, the representative of Messrs. Wm. McKinnon and Co., Ltd., seemed equally pleased. He had sold several of the machines on show, and was returning home to the works at Aberdeen with others to execute. On this stand coffee machinery predominated, but the machines shown, however, also included their latest patent rice huller and polisher. We noticed as the exhibition drew to a close that the bulk of the machines had the word SOLD attached to them. The coffee machinery, which was awarded the only gold medal given for tropical agricultural machinery, included the firm's latest patent coffee pulper, the "Bon-accord," in combination with an oscillating sieve, and their repassing pulper, fitted with the firm's patent adjustable breast. This was a very ingenious arrangement, known as "La Perfecta," worked by chain wheels and chain, so that all the doors are regulated by one operation, not as in the old style, when each door had to be regulated independently of each other. Such a method of adjusting the doors simultaneously saves much time and trouble, and ensures greater certainty in working.

Their Okrassa patent dry cherry coffee huller, also a favourite, attracted the attention of the large number of coffee planters at the exhibition. Though small in size, weighing only about 1½ cwt., it is capable of hulling 8 cwt. of dry cherry coffee per hour, and only requires two effective horse-power for driving it. Then we came to the Okrassa patent coffee peeler and polisher for parchment coffee, with the improved method of driving the fan, which likewise was much noticed by those interested in coffee machinery.

The Tyneside Engineering Co., of Elswick, Newcastle-on-Tyne, included several important machines, whilst one of their dryers was also shown at work in the Barford Street yard. The exhibits included their well-known "Chula" patent hot-air chamber dryer, suitable for rubber, copra, desiccated coco-nut, cacao, coffee, &c.

A "Chula" patent air-heater (small size), complete with fan, &c., as used in connection with the smaller sizes of "Chula" dryers.

A "Chula" fan as used for the leaf-withering installations and general ventilation of buildings.

Model of "Chula" patent duplex rubber drying and smoking plant, showing method of installation in the drying house.

Samples of galvanized steel piping used in connection with the "Chula" rubber curing plant.

Samples of copra and rubber dried by the "Chula" plant.

"Chula" patent liquid fuel attachment for air-heaters, boilers, &c. A highly efficient burner for all purposes.

"Chula" patent copra dryer, type N.D., Size 00, shown at work. This is the smallest "Chula" dryer

* Author of "Technical Handbooks on Fibres," see advt., p. xiii. TROPICAL LIFE Publishing Department.

made on the tunnel system. We then made inquiries about spraying machines.

"The exhibition generally has undoubtedly been a very fine one," Messrs. W. Weeks and Son, Ltd., told us, "and we should judge from the inquiries we received that spraying would in time be carried out much more extensively. At the present time, however, only a little is being done here and there, and that chiefly with the smaller machines that can be carried through the plantations and worked by hand.

"The larger hand machines which have to be wheeled or carried are not likely to be used much, as most of the plantations are too thickly planted to allow of their being taken between the rows. The use of power-driven sprayers, however, seems likely to grow, as these offer many advantages over the hand type. The engine and pumps can be drawn or carried to a position and worked in one of the roadways surrounding the trees or bushes, and the portable piping with spray branches and nozzles laid down as required between the rows. The quantity of rubber hose should be reduced to a minimum, as should all such materials which quickly perish in tropical climates. This, of course, can easily be arranged by using flexible connectors made of metal, and if a planter possesses such a plant the depreciation should be very small indeed.

"One of the chief difficulties is the coolie labour that has to be employed to use the various machines, and practically every grower we interviewed insisted that the apparatus should be of the very simplest construction, and at the same time strong and as fool-proof as possible. This is the class of machines we make and supply."

As reported last month, Messrs. Wm. Weeks and Son, Ltd., were awarded the gold medal given by TROPICAL LIFE for the most efficient knapsack sprayers, as well as a second, which we gave on the special recommendation of the judges, for the most efficient power-spraying machine.

Leaving this stand we soon found ourselves at the one occupied by The Four Oaks Spraying-Machine Co., whose list of exhibits covers pp. 865-870 in the handbook, the firm having many machines upstairs in the gallery as well as down in the main hall. Mr. Ludford, the head of the firm, confirmed all we have ever claimed as regards the future demand for spraying machines in the Tropics. "The increased demand for our machines in Southern India and throughout the Tropics is simply marvellous," Mr. Ludford told us; "it far exceeds anything we expected, especially for such machines as our No. 101 knapsack sprayer here" (pointing to it), "which we have designed specially for use in the Tropics, it being constructed without rubber valves, as recommended by you, and with a powerful brass pump and brass ball valves. I can honestly say that we are sending thousands of these machines to planters in all parts of the Tropics. Costing only 47s. 6d., with a capacity of $3\frac{1}{4}$ gallons, we maintain that there is no machine to compare with it at the price. Our system of double sprayers and agitators have made our machines first favourites on all sides." This company, which gained our gold medal for hand-spraying machines other than knapsacks, is going ahead and securing orders intended for their German competitors.

Wandering down the hall to ask Mr. Lyne a question, we were reminded of the existence of Messrs. Venesta, Ltd., with their rubber cases and boxes for tea, desiccated coco-nut, butter, &c., and barrels, &c., for copra, or when tin-lined for coco-nut and other oils. Their representative described to us the advantage of their new rubber case, pattern No. 210, which is made in such a way that, whilst it can be opened at either end, with interior battens at the top and bottom alike to give the box great strength and rigidity, they are so arranged that when the lid is removed the battens are withdrawn with it, so as to leave nothing to obstruct the turning out of the rubber. Strong, smooth, light, these boxes, as well as the other receptacles for shipping produce in, are making marvellous headway in favour among tropical planters.

Messrs. Hollings and Guest, Ltd., exhibited two of their all-metal bundling presses, which are the latest development in hand-screw baling machines, one of which was shown with the bale in it, tightly pressed and bound ready for removing, so that visitors could see exactly how the machine acted on the contents of the bale. The other machine was empty to enable the representative to give a demonstration of its working, which struck one as being simplicity itself. There was also showing on the stand one of the firm's small screw copra presses for extracting oil by hand power. All the various sizes of these presses are very efficient and fitted with a perforated cylinder surrounded by a channel for collecting the oil, and also with a spout. Their cost ranges from £4 upwards, according to the size of the cylinder receiving the copra. Both this and the baling machines seemed to be well designed and made of the best material. These all-metal bundling presses are suitable for export, and are applicable to all trades doing baling of any kind, especially for up-country places in every part of the world for such materials as hay, straw, alfalfa, cotton, fibres, &c., before sending them to the coast for shipment, being very light and portable. For the home trade this press is also greatly in demand, especially in the waste trade, for baling such materials as waste paper, straw, leather, cotton and woollen rags, rubber, &c., with which neat and compact bundles can be quickly and easily made. It is also capable of dealing effectively with light tin clippings making, we understand, a bundle 28 in. by 15 in. by 30 in. Its cost is very moderate, say £17 list price. There was a good supply of literature on the subject of these presses, and also other machines made by the firm, including their well-known hydraulic tyre presses for fixing and removing the solid rubber band tyres of the wheels of commercial vehicles, also their hydraulic oil and drug extracting presses and hydraulic baling presses, together with illustrated pamphlets of their stoves and steam drying machines, high pressure hot-water drying machines, &c.

Unchanged, at least to all outward appearance, we encountered the "Father of the Plantation Rubber Industry," describing the merits of the "Wickham Hard Cure" process and the demerits of most of the present plantation methods. "The Wickham process," he explained, as he gripped us by the shoulder with a force that we felt and admired for a man of his age, "produces hard cure rubber from pure latex by the application of antiseptic smoke and heat. The rubber,

as you know, consists of a series of laminæ or films, each of which is superimposed upon its neighbour during the process of smoking, and each film or lamination is individually treated and cured by the smoke impingement. The essential oils conveyed in and by the amalgam are brought about by the impingement, and the glaze films all being alike, the bulk is homogeneous and uniform throughout. The principle of curing is therefore the same as in the 'Amazon' product, and ensures a more efficient and uniform method for the production of 'Hard Cure' rubber than can possibly be obtained by the primitive hand-moulding utensils of the Brazilians.

"All the latex, as obtained from the tree, enters into the Wickham-cured rubber without residual excepting a small quantity of moisture. The process can be completed in twenty-four hours from the extraction of the latex from the tree, and the cost of production is considerably reduced. A gallon of latex may be taken as yielding on an average 3 lb. of 'hard cure' rubber."

The theory advanced, like the veteran who advanced it, was interesting and carefully noted, and from our point of view the sample lying in the Ceylon Court side by side with the Brazilian *pelle*, each ball being cut in two, so that skins or strips of the cured rubber could be handled, stretched, and compared, left nothing to be desired when pitted against the Brazilian cured article.

Rambles Round Raw Rubber.

(Continued from p. 135.)

OUR readers will remember that our ramble last month left us in the middle of the Malayan Court; here we found enough rubber to construct a small fort with, still leaving the fine pyramid of Lanadron block in the centre as the observation tower. This makes us wonder how, in case of emergency, a rubber bastion hastily constructed against the attack of an unruly gang of natives or others would serve as a check, temporarily or otherwise, if carefully backed up behind with earthworks or other supports.* One rubber enthusiast claims that it would pay to place a thick skin of rubber, at a cost of £10,000 or more, around ships, so that if they were rammed by another vessel, as in the case of the *Empress of India*, the skin would not rupture, but rebound after the inward thrust, and coming back to its original position, serve as a waterproof skin to keep the sea away from the leaky plates, if not entirely, sufficiently to help a little until the passengers disembarked, or, in some instances, until the vessel could get into port. Which idea is the most likely to be adopted we do not pretend to suggest, but personally we would rather creep in behind Mr. Wray's stacks of good "nervy" rubber when bullets, or even bigger missiles, were flying around, than to be one of 500 passengers on a vessel with even a 10-in. rubber skin that was rammed in mid-ocean.

* Mr. Jack Walker, our cartoonist, suggested that the bullets might rebound and kill those who fired them, and kindly offered to submit a design for publication showing, by means of dotted lines, how each man might (?) receive the bullet of his neighbour as it rebounded from the pile of "sheet" with which it came into contact when fired towards the fort. Want of space unfortunately compelled us to refuse Mr. Walker's offer.

We are wandering, however, so let us return to the Rubber Exhibition and assured safety. Leaving the East so busily engaged in arranging to have an agricultural college established in its midst and going across to the West Indies, where Professor Carmody tells me they have one already, and only need funds to provide professors suitably trained to draw capitalists from this side to take advantage of their training, we found balata from British Guiana side by side with sapium scrap and Castilloa biscuit, set out to prove that the West Indies has still got rubber estates.

Here we found some interesting exhibits of rubber, although this year they were, perhaps, less noticeable than in 1911, owing to the very fine show of tropical products generally, and of limes in particular, which covered the counters of the West Indian Section. The combined exhibit, stretching as it did half across the hall, each colony leading into its neighbour, showed at a glance what these fertile islands and British Guiana can produce, besides rubber and cacao, for those with some capital and plenty of energy and patience, willing to try their luck out there.

Among the rubber and balata exhibited, we noticed samples of plantation Pará biscuits of good quality from the Issorora and Onderneeming Stations, Department of Agriculture, British Guiana; also from "Pln Leonora," belonging to Messrs. Sandbach, Parker and Co., Pln Inschen, of Messrs. Booker Bros. and McConnell, Ltd., and Hills Estate up the Mazaruni River. Pln Providence also exhibited biscuits, whilst Mr. W. Hodgson, of Pln Noitgedacht, sent both sheet and biscuit, and Demerara also showed some Sapium scrap collected by aboriginal Indians up the Orinoco. Large Castilloa biscuits, of whitish interior, came from Stowe Estate, Dominica, and British Honduras sent scrap sausage or long twist, as well as some dark Castilloa sheet.

On their well-arranged stall in the smaller hall, under the charge of Mr. W. H. Johnson, the Director of Agriculture, Nigeria showed Funtumia biscuit and crêpe, sent specially for the exhibition, as well as some from the Imperial Institute, also large balls of Jandunko rubber (*L. orwariensis*) and some cheese-shaped blocks of Awaya balata from *F. vogelii*. There were also samples of Pará rubber which were carefully discussed by those still uncertain how this rubber will do in Nigeria should prices increase sufficiently to make it worth while cultivating. The Philippine rubber exhibits rather disappointed us, although Mr. O. W. Barrett, the Commissioner, laid them out to best advantage. They included Pará crêpe and Castilloa block, and a rather ugly block of tacky mixture, but whether Pará or one of the vine rubbers indigenous to the Philippines (*Parameria philippinensis* and *Chonemorpha elastica*) we do not know. Discussing rubber problems with Mr. Barrett, he told us that it can hardly be said that there are more than half a dozen good estates to be found in the whole length and breadth of the Philippines. At first it was believed that Ceará and Castilloa were best to plant, but experience points to Pará as being the only variety likely to stand the test of time. In an article he contributed to "The Rubber Catalogue,"* Mr. Barrett discusses rubber prospects in the Philippines very fully, and also tells us about the wild

* Pp. 1,041. Many photographs and illustrations. Post free (it weighs 4½ lb.) 6s. 6d. TROPICAL LIFE Publishing Department.

vines mentioned above, and of the Chinese trade in gutta-percha. The East African Protectorate showed Ceará rubber from Malindi that gave one a good idea of what certain districts in that Protectorate can produce.

Skipping across to Fiji we found quite a lot to interest us with rubber and other produce. To begin with other produce, we here found a coco-nut in husk that had been sawn in two, showing its thickness of husk and shell compared to diameter and thickness of kernel. This nut we consider was the best in the whole exhibition and an ideal one for planting, since it had the maximum of copra to its size and weight of fibre and shell. There was no label, so far as we could see, to show who the exhibitor was. As regards rubber, its cultivation on a commercial scale in Fiji may be said to date from 1906. At first Ceará was planted as well as Pará, but we understand that the winds discouraged their growth and Pará alone is cultivated to-day on a large scale. One of the best known cultivations is to be found at Levuka, on the island of Vanua Levu, and belongs to Captain D. Robbie. This estate has been steadily extended for some time, and is, from all accounts, being tapped to a considerable extent. According to the handbook, the islands can boast of an indigenous rubber-bearing tree, *Alstonia plumosa*, which is found in the forests. This tree is said to be capable of cultivation, but gives trouble when it is time to collect the latex, which does not flow from incisions, but apparently only when a fracture takes place, say if a leaf or twig is broken off, when drops of latex fall and may be collected. Such a process is described as being tedious and costly, but whether the difficulty can be overcome by the invention of a mechanical method of securing the latex has yet to be seen, though we think it is doubtful. Noting these details in the handbook we looked for samples of rubber supplied by the tree, but could not find any, which seemed to us a serious omission. Plantation kinds, however were well represented and included Pará biscuits from Captain Robbie's estate, smoked diamond sheets by the Pacific Lumber Company, and thick sheet from the Yarawa Plantation, belonging to Messrs. Thomas Crosse and Co., whilst photographs were shown of the estate of the Waidoi Rubber Plantation Company. Crossing over to Queensland we did not find that this State showed so wide a range of rubber as before, confining its energies rather to proving what a wide range of tropical products it can grow, especially sugar, fibres, &c., and of course cotton. Those who wish to see rubber cultivations increase urge that the Queensland climate is extremely favourable, whilst the soil also is very suitable for the crop.

THE manner in which the short-sighted public policy of this country in the past has forced our Government to seize anyone's and everyone's horses reminds us of the story of *La Cigale*, only in this case the selfish grasshopper who refused to lay up a store (of horses) can still smile, since the law allows her to grab those of her neighbour, the ant. When the war is over we trust the same law will force the grasshopper to breed her own war horses in future, and not (practically) steal those of her neighbours by inadequately paying for them, to say nothing of the loss of trade their absence causes the ex-owner to suffer.

Plantation Rubber Machinery of the Future.

To the Editor of TROPICAL LIFE.

SIR,—In continuation of my letter of June 1, which I thank you for publishing in your June issue, I now beg to call your attention to the following cutting from the *Ceylon Observer* of July 9, if you have not already commented on it, for it originally appeared in the *Financial Times* of June 19. It not only confirms all that I and others have said about overmilling the rubber, but emphatically points, as you did in your "Rambles Round Raw Rubber" in the July number, to the necessity of adopting entirely different methods on estates when preparing the rubber for market. As the following remarks were made by Mr. Alexander Johnson, General Manager of the North British Rubber Company, of Edinburgh, one of the leading manufacturing firms over here, the complaints raised, and the advice tendered, are of the weightiest kind; and no planter can afford to ignore them. In the course of his remarks (at the luncheon on June 18, given by his company to celebrate the remarkable success achieved by their Clincher tyres, made of plantation rubber, in the Royal Automobile Club's test for wear after 5,000 miles run) Mr. Johnson told the representatives of the plantation rubber industry and Press as follows:—

"VARIABILITY AND MACHINE WASHING.

"Now, what does this variability consist of? In my opinion, there is very little difference in the original latex from the various plantations, so the trouble must be sought for in the preparation. Now, as a manufacturer, I must tell you frankly that more harm is done to plantation rubber by mechanical operations than can be imagined. Every time rubber goes through a machine a percentage of its life and value goes; if the working it is subjected to is severe, it is practically killed. Rubber has life and nerve of a high order, and the successful manufacturer realizes this and nurses its strength through every operation. Machines are used on some plantations to which no manufacturers would dare to subject his rubber. The most significant fact, however, to remember is that the vulcanization of rubber is affected by overworking. Variability in vulcanization is the chief bogey which manufacturers have to face in using plantation rubber, and in my opinion that is caused entirely in the working of the rubber on the plantation. I have personally never been able to understand the principle underlying the supply of crêped rubber, except that no doubt it is more convenient to the plantation to handle. No self-respecting manufacturer uses crêpe as received, but washes it again, so that the original machining does not mean an operation saved. My experience is that variation in crêpes is very great, but in biscuits and sheet it is reduced to a minimum; again, it is significant to note that the old Ceylon biscuits were practically as uniform as Pará. I therefore earnestly recommend all planters to look carefully into the washing of their rubber. Some machines are practically harmless, while others do untold damage. Planters will always find manufacturers ready to advise them as to the form of their machines. But undoubtedly plantation rubber will be a better product when it comes to the manufacturer, as (Amazonas) Pará does, without ever having touched a piece of machinery."

Yours as ever,

London, August 4, 1914.

STILL UNBIASED.

The (1914) Rubber Exhibition Awards.

THE presentation of awards in connection with the TROPICAL LIFE, Rubber Growers' Association and other competitions at the above Exhibition were made by Sir Henry Blake in the Council Room of the Rubber Growers' Association on July 27th, when the following prizes, accompanied with their certificates, were handed to the fortunate winners:—

"TROPICAL LIFE" COMPETITION.

For the best sample of Cearà Rubber.

Gold Medal.—Awarded to Mr. W. Egerton (Coorg Coffee Co.'s Estates, Coorg, Southern India).

RUBBER GROWERS' ASSOCIATION COMPETITIONS.

Competition No. 1.—For the best commercial samples of Plantation Rubber:—

Class 1, Crêpe.—*Gold Medals*—The Kintyre Tea Estates Co., Ltd.; The Balgownie Rubber Estates, Ltd. *Silver Medal*—The Inch Kenneth Rubber Estates, Ltd. *Bronze Medal*—The United Serdang (Sumatra) Rubber Plantations, Ltd. *Diplomas of Honour*—The Carey United Rubber Co., Ltd.; The Pataling Rubber Estates Syndicate, Ltd.; The Trong Rubber Estates, Ltd.; The Labu (Federated Malay States) Rubber Co., Ltd.

Class 2, Smoked Sheet.—*Gold Medal*—The Highlands and Lowlands Pará Rubber Co., Ltd. *Silver Medal*—The Seafield Rubber Co., Ltd. *Bronze Medal*—The Jugra Land and Rubber Estates, Ltd. *Diplomas*—The Selangor River Rubber Estate Co., Ltd.; The Chersonese (Federated Malay States) Estate, Ltd.

Class 3, Assorted Grades.—*Gold Medal*—The Highlands and Lowlands Pará Rubber Co., Ltd. *Silver Medal*—The Kintyre Tea Estates Co., Ltd. *Bronze Medals*—The Jugra Estates, Ltd.; The Pataling Rubber Estates Syndicate, Ltd. *Diplomas*—The Balgownie Rubber Estates, Ltd.; The Lauderdale Estate.

Cup given by Mr. John McEwan (Chairman of the Rubber Growers' Association) for the best exhibit wherever produced.—Mr. R. D. Greenhill, Manager of Highlands and Lowlands Estate in the Federated Malay States.

Mr. Thomas North Christie's Cup for the best exhibit produced in Ceylon.—Mr. J. Farley Elford, Manager of the Ayr Estate (Kintyre Tea Estates Co., Ltd.).

Mr. E. L. Hamilton's Cup for the best exhibit produced in the Federated Malay States or Straits Settlements.—Mr. P. F. Wise, Manager of Balgownie Estate in the Federated Malay States.

Competition No. 2.—For the best exhibit connected with Plantation Rubber grown in the Middle East.—*Gold Medals*—Government of Ceylon; Government of the Federated Malay States. *Silver Medal*—Messrs. Harrisons and Crosfield, Ltd.

Competition No. 4.—Manufacturers' Section. For the three best exhibits of rubber flooring in tile or sheet form.—*Gold Medal*—The North British Rubber Co., Ltd. *Silver Medal*—The Leyland and Birmingham Rubber Co., Ltd. *Bronze Medal*—The Northern Rubber Co., Ltd.

Competition No. 5.—For the best exhibit composed of the greatest variety of articles made from rubber for commercial purposes.—*Gold Medal*—The Leyland and Birmingham Rubber Co., Ltd.

Competition No. 6.—For the discovery and application of such new use for plantation rubber as may be adjudged the most valuable, special consideration being given to the weight of the rubber which such application is likely to consume.—*Cash Prize of £50 and Gold Medal*—Mr. Morland M. Dessau, for application of rubber to road paving.

Competition for Rubber Soles for Boots and Shoes.—*Bronze Medal*—The English Rubber Co., Ltd.

The President's (Sir Henry Blake) *Trophy* for the best general exhibit of manufactured rubber.—The North British Rubber Co., Ltd., Castle Mills, Edinburgh.

Special Silver Bowl, presented by the Exhibition.—For their exhibit of manufactured rubber, the Leyland and Birmingham Rubber Co., Ltd., 26, Duke Street, Aldgate, E.; and the *Special Silver Cup* presented by the Exhibition went to the Harburg and Vienna Rubber Co., 1-3, Golden Lane, E.C.

The Mincing Lane Tea and Rubber Share Brokers' Association Prize for the best suggestion for new uses for plantation rubber was won by Mr. Morland M. Dessau, Constadt Works, Lower Edmonton, N.; whilst the well-known *Silver Cup* of the *India-rubber World* of New York, now given for the best system of coagulating plantation Hevea, was won by Dr. Carlos de Cerqueira Pinto, of Pará, who triumphantly bore it off amidst the applause of the assembly.

Of the *India-rubber Journal* competitions, the Cash Prize (£25) for the best "Rubber Estate Photographs" went to Mr. H. F. Macmillan, Department of Agriculture, Peradeniya, Ceylon; and the best essay on "Ideal Rubber Estate," also a Cash Prize (£25), to Mr. Leonard Smith, Kapar, Selangor, Federated Malay States.

The *Rubber World* offered a Silver Cup for the best essay: "What is an Ideal Rubber Estate," and this was won by Mr. T. Clifton Hutchings, State of Kelantan; whilst their Silver Salver went to Mr. J. McNicol, Tasarg Estate, Kuala-Nal, Kelantan.

Of the *West India Committee* awards, the Silver Cup for the best sample of rubber from an individual exhibitor from the West Indies went to Hill's Estate, British Guiana.

The "Gummiwelt" (Hanover) gave a Gold Medal for the best rubber manufacturing machine of German make, and this went to the Harburger Eisen- und Bronzwerke A-G, Harburg a/Elbe, Germany.

Those interested in the much discussed Rubber Trade Tennis Tournament may like to know that the First Prize, Two Silver Cups presented by Mr. Arthur Lampard, were won by Mr. A. A. Craigen and Mr. H. E. Mason; and the Second Prize, Two Silver Cups presented by the Mincing Lane Tea and Rubber Share Brokers' Association, by Mr. H. M. E. von Berg and Mr. A. G. von Berg.

The prizes for the cotton, coffee, copra, and other exhibits have still to be given. In the present unsettled state of affairs the date is uncertain, but as soon as possible arrangements will be made to present these as well. Meanwhile, one is obliged to ponder with regret over the terrible breach that the behaviour of a few men has brought about between those who were gathered together under such pleasant circumstances when the judges were awarding these prizes.

A FURTHER sign of the closer attention being given to the development of agriculture in India, and especially to increasing the output per acre, is shown by the way in which the leading manure interests are studying the requirements of our Indian Empire with regard to replacing in the soil the plant-foods removed by the crops, and of bringing exhausted areas generally up to that average yield which they ought to give. Among the latest experts to "go East" has been Mr. G. F. Kibblewhite, whom we had the pleasure of meeting at the Rubber Exhibition, who left on July 24th for India and Ceylon, and was therefore well away before the European outbreak could interfere with his journey. He is travelling on behalf of the Nitrogen Fertilisers, Ltd., of London and elsewhere, on a tour of inspection and, at the same time, to organize and extend the use of Nitrolim throughout the East. Knowing how anxious the Indian Government is to augment the output of foodstuffs and raw materials in India by increasing the yield per acre, the Company and Mr. Kibblewhite both feel that the time has arrived to demonstrate by practical experiment the advantages of judicious applications of Nitrolim to tropical crops, even in many cases which up to now, through climatic or other reasons, have not proved responsive or remunerative to the application of manures. The directors feel, however, that the experiments to be undertaken by their representative will prove the value of atmospheric nitrogen in increasing the productivity of the soil, and so they are sending out Mr. Kibblewhite, who has had considerable experience of agricultural conditions in the Tropics and elsewhere, first to investigate agricultural conditions out East, and then to prove the value of Nitrolim for increasing the output of crops per acre as well as to invigorate and build up the plants and trees that produce these crops.

THE current quarterly issue of the *Bulletin of the Imperial Institute* (vol. xii, 1914, No. 2) contains, among the reports of recent investigations by the scientific and technical staff, the results of examination of samples of soils from Nyasaland, of penguin guano from the Falkland Islands, and of flax from the East Africa Protectorate, where it is thought there is every prospect of the cultivation of this fibre becoming established in Nyanza Province. Other reports relate to cacao from Nigeria, copals from British West Africa, essential oils from various countries, and cohune nuts from British Honduras. A special article, by Mr. W. Small, M.A., B.Sc., Botanist of the Department of Agriculture, Uganda, deals with coffee cultivation in Uganda. It appears that coffee is now the staple crop of European planters out there. The area is being extended, and a large increase in the exports of coffee may be looked for in the next few years.

An article on the utilization of fish and marine animals as sources of oil and manure (Part I, Oils) discusses the composition and uses of fish oils, their sources and preparation, and also describes the present position of the whaling industry. Fur farming in Canada and the tin resources of Malaya and India are dealt with. It is interesting to note that considerably more than half of the world's supply of tin is produced within the British Empire, our output in 1911 being 60,497 tons against 54,051 from elsewhere.

Economic Zoology.

Our Motto, "Utilization not Extermination."

"OUR live stock is increasing rapidly," Mr. E. A. Kolbe, of the Free State and one of the South African farmers who have been touring England, told the Press just before the contingent left for Holland, "and though a few years ago we had to import considerable quantities of meat, we are now in sight of an export trade. In fact, I think that as far as cattle are concerned, South Africa will become a great exporting country, and will enter into keen competition with the countries which now supply Europe with meat."

"Your farming is excellent, but it all seems to be carried on by old men," said another of the visitors. "I suppose the wages are not big enough to attract the young ones. But what will you do when the old men die out?"

The above remark points to South Africa becoming an exporter of chilled meat in the near future, and no doubt when that day comes Sir Owen Phillips will be ready with the ships to bring them home. The sooner this happens the better for us, as we need the meat badly; and also the better for South Africa, for experts tell us that the present output of gold from the Rand may be maintained for five years, but after that date the annual output will decrease at such a rate that by 1930 it will fall to half its present figure. As at present South Africa depends more upon the produce of its mines, which amounts to 80 per cent. of the total exports, the need for developing other industries to replace the one which we are told has already attained its zenith is obvious. We wish all success to those on the spot who are striving to work out the salvation of their State through agriculture. The only word of advice we have to offer—one, however, that we believe is superfluous—is that every care will be taken to safeguard the tree-life of the continent and to do everything possible to prevent South Africa from drying up.

The second statement, that farming over here "seems to be carried on by old men," is only too true, and is a state of affairs we have been fighting to counteract for some years. If the Educational Department of the Government, as well as the various bodies distributed throughout the country, would only train the children in State-aided schools, workhouses, charitable institutions, &c., to be agriculturists, not only would our home supplies of foodstuffs be increased, but there would be less of a struggle for existence in the towns. Again, when those trained went abroad they would be welcomed, whereas at present, since the Government insists on only training us for town industries, entrance to the Colonies and overseas centres is practically closed to all but the capitalist. If the African farmers have learnt from us during their tour, we hope educationists in England, who at present are very obstinate and narrow-minded in the curriculum laid down, will learn something from this remark of one of the African farmers.

MESSRS. DAVID BRIDGE AND CO., LTD., of Castleton, Manchester, in answer to our circular, say that they are ready "to make hay whilst the sun shines in the Tropics," and if every reader of TROPICAL LIFE will ask for a copy of their new catalogue (Section K 3), it will force them to send orders and so increase the sunshine over here.



"Tropical Life" Friend.—No. 110.

MR. R. N. LYNE, F.L.S., F.R.G.S.

Director of Agriculture, Ceylon.

WE may be excused for saying that, previous to our having had the pleasure of meeting Mr. Lyne at the Rubber Exhibition and the Tropical Agricultural Congresses in London we used to wonder how he, a comparatively new man, should have been appointed to one of the most important billets in the tropical agricultural world. As Paris seems to be the height of ambition for the budding ambassador of English birth, so, should we imagine, must the Ceylon directorship of agriculture be to those who wish to "make good" in the world of tropical agriculture. Naturally, therefore, when the present occupant of this important berth suddenly dropped into it, without any apparent word, warning or trouble, we wondered what he had done to have been so unexpectedly placed there.

All this was before the Imperial Institute Congress and the Rubber Exhibition. Having met Mr Lyne at these functions, after hearing his views on tropical agriculture, and discussing the details with him, we soon realized why he secured the Ceylon directorship. We put it down to his being painstaking and thorough.

"Our Friend" first went to the Tropics in 1906, on being appointed Director of Agriculture at Zanzibar, after slavery had been abolished, and the absence of money, coupled with the low price of cloves that had been ruling for some time, had reduced the fortunes of the islands (Zanzibar and Pemba) to a very low ebb, and it took many years of care and patience to enable the Protectorate to even partially recover itself.* During the fourteen years that Mr. Lyne was there, however, a considerable increase in the output was noticeable, and whilst the general average increase was about 40 per cent., that from the plantations, perhaps one hundred in all, owned by the Sultan, and under the charge of "Our Friend," showed 90 per cent. increase, and had the general plantation owner

handled his trees with the same care the output all round would have been nearer to 70 than 40 per cent.

Mr. Lyne is not a man to sit still, so, needless to say, he was always on the move when opportunity arose. He made several trips from Zanzibar to British East Africa to study agricultural methods and conditions out there. The year 1902 saw him travelling by the first through train from the coast (Mombasa) to Lake Victoria, after which he drew up a report of the agricultural prospects of the plateaux around and alongside the Uganda Railway for the Commissioner of that Protectorate (Sir Charles Eliot), which report was, later on, presented to both Houses of Parliament. "Our Friend" has also made several expeditions in German East Africa to study fibre and rubber there.

The Zanzibar Exhibition of 1905 was organized by him, and voted a great success. For his help in this direction Mr. Lyne received the thanks of the British Secretary of State, which official had again to thank him in 1910 for his particularly able annual report of the previous year, whilst the Sultan of Zanzibar has on at least three occasions decorated Mr. Lyne as a mark of His Highness's appreciation of his services to the Protectorate. In 1910 "Our Friend" was "lent" to the Portuguese Government, who appointed him Director of Agriculture in Portuguese East Africa, through which territory he travelled some 2,000 miles by land and water as Director, to study and organize the industry.

Ceylon came to know Mr. Lyne in 1912, when he was appointed Director of Agriculture to that island, a post that he still holds. One of his first acts was, we believe, to convert the then Royal Botanic Gardens Department to the present and more important Department of Agriculture. Besides being Director of Agriculture Mr. Lyne was also appointed Registrar of Co-operative Credit Societies in the island, in which capacity he has successfully established several co-operative societies among the peasantry.

Educated at Canterbury Agricultural College, University of New Zealand, Mr. Lyne emerged with certificates of honour for being first in eighteen subjects, theoretical and practical. He has all along been working with us to get agricultural colleges established in the Tropics, and whilst he, naturally, wants Ceylon to have the first one, he has promised, as stated in the July issue (see Mr. Lewis Harcourt as "Our Friend," p. 130), to do all he can once Ceylon has her college to help the West Indies secure the second one.

Mr. Lyne is a Fellow of the Linnean Society, and of the Royal Geographical Society. He is a member of the British Committee of the International Association of Tropical Agriculture and Development, and acts as correspondent in Ceylon for that Association. Appointed Commissioner for Ceylon to the Rubber and Tropical Exhibition, his papers at the Imperial Institute and at the Rubber Congress were much appreciated, whilst the author himself was voted a very useful man and a right good fellow by all who met him. Among the publications from Mr. Lyne's pen we can recall "Zanzibar in Contemporary Times," and "Mozambique; its Agricultural Development," whilst the many articles he has contributed to the *Tropical Agriculturist*, of which he is editor, and to other publications, has placed him in the front rank of authorities on tropical agriculture.

* In our March issue, p. 45, we gave, it will be remembered, full particulars of the clove industry in Pemba and Zanzibar, and showed how and why they now offer good openings for the investment of capital if organized by British experts.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

AUGUST, 1914.

War, Wheat and Tropical Food-stuffs.

THE day after hostilities first broke out in Europe between the Teutons and Slavs we received a visit from one of those well-informed and observant tropical globe-trotters, who, always welcome, are like ourselves anxious to increase the food supplies of Europe, and to see a larger proportion of men turn agriculturists instead of "collecting together, crowded in the courtyards (called cities) of Europe and neglecting to develop the resources of the world outside." In this case we were discussing the possibilities of the Tropics supplying a substitute for wheat, from which to make bread, biscuits, &c., or a similar food, as army and navy rations, or on which to feed the million. We criticized the possibilities of flour and foods made from bananas, cassava, bread-fruit, &c., to augment and increase supplies at present drawn entirely from wheat, which tend to increase far too slowly to please those who are dependent on them. One of the large consuming centres, maintained our visitor, has increased its demand for wheat and wheat products by 22 per cent. during the same period that the supplies have increased only $4\frac{1}{2}$ per cent.

Such a statement makes one remember that the war in Europe will certainly restrict the output of cereals, potatoes and sugar-beets, &c., for even if these crops ripen and are taken off the land, which will not be the case over wide areas, transport facilities will be lacking, as the railways and roads will be monopolized by the troops. The effect of this upon prices will be immediate and, from a consumer's point of view, most disastrous. Food riots broke out in Vienna almost before war was declared; wheat was put up 2s. 6d. and more a quarter, and flour 5s. a sack immediately hostilities were decided upon. If this is so at the start, what the state of affairs

will be when this article is in print remains to be seen. A six months' war will alike see the householder and army commissariat department at their wits' end to know what to do; if it lasts for two years the poorer classes on the Continent must starve.

It is well, therefore, at times like the present, to ask what can be done to spread out the area under wheat, and also to bring to market other products from which to make bread and breakfast-foods to help soften the increasing strain on the heads of families to feed all the mouths, not only to fill the body but nourish and develop it at the same time. What, for instance, can the Tropics do to help in this; the Tropics whose help in the case of a European war would be so valuable, as, being miles away, they could go on producing and exporting without having their fields trampled down by armies, or their men called away to fight.

We are no believers in "crank" foods, but it is no crank statement to say that, weight for weight, much nourishment can be obtained from sweet-potato flour, banana flour, and other fruits and vegetables produced in the Tropics. The Rubber Growers' Association have been giving substantial money prizes to the man who can invent fresh demands for raw rubber on a large scale. Napoleon offered and, we believe, gave a big prize to the man who produced sugar from a source other than cane, viz., beet. Think, therefore, what a reward should be given to those who can come forward at times like the present and show us in Europe how to cheaply feed the million. Long before the last shot of this conflagration has been fired we may realize the mistake of being so dependent on other European countries, even for such things as eggs, bacon, butter (animal and vegetable), &c., whilst even eggs can nowadays be kept in the cold chamber for weeks, and so certainly for a sufficient number of days to enable them to be produced in huge quantities in the Tropics and brought over here for consumption. This being so, why not do it? Compared to bread, the above may be semi-luxuries, but they are necessities too, and the supplies cannot be allowed to stop through war in these days of huge populations packed in small areas. Germany, we believe, is already exporting tons of palm-oil butter for human consumption, whilst the edible products she now manufactures from tropical raw materials, especially copra, are enormous; those from copra must equal, if they do not exceed, those of France. According to *The Financist* for July, Germany imported last year 195,000 tons of copra, against 45,000 tons only in 1906. This, therefore, shows an increase of 430 per cent. in eight years; and if France has not increased latterly at the same rate that Germany has, it is only because she imported such huge quantities, comparatively speaking, before. In 1906 she took 128,000 tons; in 1912, 178,000; whilst last year her total has increased, but we have not the figures by us, and answers to our letters asking for them are not yet to hand. Imagine, therefore, the plight the households of the European middle and lower classes will soon be in when, already pinched for money, they are further deprived of cereals, eggs, butter, &c., because of their inability to import supplies, to secure men to work the factories, and of the reduced spending capacity of themselves; and although coco-nut butter is but one of several foods, it is important to keep up the supplies of this as well as of all food-stuffs.

Times of great prosperity spoil most men and women. They first get swelled pockets, and then "swelled heads." Perhaps it will be as well if they are allowed to let off the surplus energy and steam, to get killed and maimed and impoverished. Then perhaps they will return home again less bumptious and wiser in many ways. Overprosperity begets ill manners; adversity makes us kinder towards others. The face of Europe is not likely to be changed to what it was fifty or a hundred years ago, and so if those who caused the fight get a good drubbing we may then run a chance of reducing the cost of armaments in Europe, and of getting one or two per cent. of the milliards now being thrown away and absolutely wasted, year after year, in warships and munitions of war, to devote to furthering the economic development of the Tropics, of establishing agricultural colleges out there, and encouraging chemists, food experts and others to increase the output of food-stuffs, meat and vegetables, and develop new kinds of supplies from oversea centres. The money would also help to distribute as well as extend the areas not only in which the food is produced but also manufactured, so that in case of an outbreak of war the man in the street, and especially the children in the gutter, will not have to go short to please the plutocrats and the army contractors on the Continent who have brought the trouble about our ears. To-day the Tropics are invaluable to the households of Europe; in the near future they will become indispensable both for army and navy rations as well as household supplies, so let us lose no chance of developing their resources, and of showing the European how to make bread out of tropical products as he is now doing out of wheat grown in India and elsewhere. We already need all the wheat we have got; we shall need much more and get much less before many months have passed, and what happens this year will happen again.

Two words in conclusion. After securing our food supplies and ammunition, the next important item in war is transport. Has not the present outbreak shown how right we were to urge the Government and others to try and breed remounts much more freely in our Overseas Dominions as well as at home? And does not the demand for liquid fuel demonstrate the need of our planters manufacturing alcohol from tropical waste matter (cacao, sisal, banana, &c.), instead of trusting only to petrol or potato spirit "made in Germany"? Later on we hope attention will be given to fostering both these tropical and colonial industries.

In the past, as in the Paraguayan and South American Inter-Republic Wars of last century, and the Balkan States War of the other day, we were told that had it not been for the women who remained at home and ploughed the land, and gathered in the crops, these countries would have gone to the wall. It will be interesting when this war is over to ascertain the share that girl clerks in London and the provinces will have played in keeping the trade of London going whilst the men were away fighting. We dislike seeing girls employed in offices, but since they are here we must realize that they are an enormous help to the trade of London by enabling the men to go and fight whilst they do the work of the office, and so serve as soldiers to help the "brains" of London fight to keep our trade going and over-seas markets supplied.

The (1914) Philippine Exhibition.

THE *Philippine Agricultural Review* for April contains an interesting account of the Exposition—to use the American term—held there in the early part of this year. Owing to a serious fire on January 26th, when some \$100,000 or £10,000 worth of provincial and individual exhibits were lost, the opening had to be postponed until February 7th. In spite of this trouble, the exhibition generally is described as having been "bigger, better, and more satisfactory in all ways than any former one." Cements, calcareous and siliceous materials, nipa and nipa products, mining, maize, tobacco and distilled spirit seemed to have been prominent features. No doubt coco-nuts and coco-nut products were also, but the report devoted only seventeen lines to this important article, in which we are told that the exhibit consisted chiefly of nuts and copra from Laguna Province which were displayed in a very attractive manner, the roof and ceiling of the kiosk being made of coir fibre, whilst the posts, table, and lower part of the kiosk were decorated with coco-nuts. Specimens of several varieties of coco-nuts were on show, and the great contrast between copra produced by the different methods of drying was demonstrated; steam-dried, sun-dried, tapahan or smoke-dried copra being shown side by side for comparison and comment.

By no means the least interesting or useful portion of the exhibition must have been the Bureau of Health's exhibit to drive home in a striking manner the danger surrounding residents in the Tropics from disease bacilli, mosquitoes, flies, bugs, fleas, and other pests. Large models of the insects were fastened on to natives, and photographs included in the report have a most realistic effect, especially when the bare, brown, skinny legs of the native peep out below the wings or bodies. Models on a table represented two companies of soldiers marching, one against an opposing cannon, and the other against a test-tube used to indicate typhoid bacilli, and denoting the relative incapacity of the American soldiers during the Spanish-American War. This showed that to only one man lost (died) by the cannon, one man died and fourteen were incapacitated by the typhoid bacillus alone. Other models showed the advantages of sanitary buildings, courtyards, streets, rooms, &c.

It is now expected by persons who are in a position to be well informed, the *Indian Trade Journal* tells us, that the Argentine maize crop of the present year will reach at least nine million tons, and that two-thirds of the total will be available for export.

WE regret that want of space has prevented our giving the new and enlarged edition of "A Handbook of Tropical Gardening and Planting," by Mr. H. F. Macmillan, the Superintendent of the Royal Botanic Gardens, the attention it deserves. We are, however, glad to see so much fresh information on the subject, and to know that there was such a good demand for the first edition as to render the publication of a second one necessary.

Tea Notes.

THE past season may be described as a record one so far as producers are concerned. But, on the other hand, distributors have not had a good year; high prices in Mincing Lane, without any increase in the retail price to the public, have restricted profits and made trade more difficult to handle. A steady increase in the consumption of tea in the United Kingdom has been a feature in the past season's trade, and has undoubtedly been the chief factor in contributing to the high level of value reached for the bulk of the season's imports.

To turn to the producing countries individually:—

India, for the third successive year, constituted a record, the total for North and South India amounting to 289,381,559 lb., against 281,408,429 lb. in 1912-13, and 264,757,377 lb. in 1911-12. The bulk of the increase in the crop from Northern India was harvested in the Dooars, which had a record season, both as regards quantity and price realized. The present position of the India tea industry has been reached by the adoption of improvements in methods of cultivation and manufacture.

Ceylon has increased its output during the past year by about one million pounds, and the crop was rather more attractive than in the previous season. There has been a very active market for Ceylon tea during the whole of the year, and a higher average price has been reached than for twenty years past. It is stated, regarding Ceylon teas, that demand has overtaken supply, and the very low stock at the end of May—some 4½ million pounds lower than in the previous year—would seem to confirm this assumption.

The large increase expected from Java did not materialize, as instead of from 10 to 12 million pounds only three million pounds more were exported than during the previous year, a protracted drought seriously affecting the yield.

The imports from China have again declined, the total being 17¼ million pounds, against 19 million pounds last year; and, unless very high prices rule for other growths during the current year, there is not much hope for any considerable increase in the import of China teas. They are not attractive to the blender, and the compulsory use of them has limitations. The respective merits of British-grown and China teas must be decided by personal predilection, and the imports indicate clearly the direction in which popular taste has inclined. It is purely a case of scientific methods prevailing over unscientific ones.

In the Quarterly Journal of the Scientific Department (Part I of 1914) of the Indian Tea Association, there is a note on the relation between the tea mosquito and the soil, written by the Entomologist. Mr. Andrews states that the question of the distribution of the mosquito blight is one of considerable complexity, and a study of the blight in the Dooars brings out the following points:—

The pest is worst in the extreme west, and, towards the east it is, broadly speaking, worst in the gardens furthest from the hills. This is the area occupied by the grey sandy loam of the Dooars, the remaining area being almost wholly Red Bank. Mosquito is severe, however, on certain Red Bank gardens. This might be considered to be due to one of two causes:—

(1) The Red Bank, being a richer soil than the grey sandy loam, the tea grown on it is naturally less liable to blight, and, in the Red Bank gardens which get blight, the soil is somewhat deteriorated.

(2) There is some peculiarity in the grey sandy loam which is gradually being acquired by the soil of some of the Red Bank gardens.

At first sight the former appears to be the more plausible suggestion, but in the worst blighted part of Cachar, the Hailakandy district:—

(1) The tea on the teelas is, on the whole, less liable to blight than on the flats.

(2) The tea on the stiff clay flats of the district is less liable to blight than on the bheel.

Here the tea growing on the richest soil is more liable to blight, and, also, the soil on which the tea is least affected, namely, the teela soil, is distinctly similar in chemical

composition to the Red Bank of the Dooars. This seems to point to some peculiarity, which, if it be present in the grey sandy loam of the Dooars, should be equally present in the bheel, and this is found to be the case.

After giving some particulars of the analyses of samples of the grey sandy loam mentioned, Mr. Andrews goes on to state that so far as has been at present observed, one may say that mosquito blight is found on tea planted in a variety of soils in which the actual and relative amounts of the different constituents may be very different, but that the tea planted on soil in which the ratio of available potash to available phosphoric acid is low will be more likely to be attacked by mosquito blight than tea planted in soil in which this ratio is high.

At the public sales on August 18th there was a good demand for Ceylon tea, and full to dearer prices were realized, especially for good liquory broken.

Where Rubber is Used. No. 4.



No. 4.—The Rubber Room at the (1914) Rubber Exhibition, in which everything but the ink and the electric light was made of rubber, even the curtains and the "leather" and "wood" of the furniture. All these were made by the North British Rubber Co., Ltd., Edinburgh, who won the much-coveted President's Trophy for the best general exhibit of manufactured rubber.

[Month by month we propose to include a photograph similar to the above, illustrative of the more modern uses of rubber, especially on a large scale.]

East Africa Protectorate.

THIS exhibit must have proved of considerable interest and use to the private planter, or would-be producer, on account of the diversity of products it contained suitable for individual owners with a fair amount of capital, as well as for concerns with plenty of money at their disposal. Taking coffee first, excellent samples were on view, all, we believe *C. Arabica*, together with photographs of the estates. As many of our readers know, coffee growing is now an important industry in the country around Nairobi, and it is estimated that from 4,000 to 6,000 acres are under coffee already, and of this area a good proportion, if not the bulk of the estates have reached the bearing age, whilst a large area of land suitable for producing the finer grades is still available for development in the higher lands of the Protectorate by purchase from private owners. After having seen the samples grown, and discussed the future of the industry in the East Africa Protectorate with our old friend Mr. Henry Powell, who again represented this coming centre, we hope and believe many of those who visited the stand will go out to the Protectorate to plant, as the locality—the Protectorate of course extends from the sea coast to the Lake Victoria Nyanza, where it joins Uganda—appeals to us as being eminently suited for European settlement in every way, and especially for coffee planting and coco-nut cultivation, provided of course that precautions

are taken to keep out pests and the beetles: or, if they appear, to get rid of them.

The coffee shown from the (now well-known) Kikuyu district, Ukamba Province, from the estate of Mr. Douglas Cooper, or Messrs. Lushington and Watson, or from the Government Farm at Kibos, Mr. F. Watkin's estate, Solai Valley, Nakuru, or Mr. A. D. Impey, Limuru, show careful cleaning, and also that suitable soil and climatic conditions prevail out there. The same with the coco-nuts from Witu Rubber Estates, Ltd., husked and unhusked, and the United Methodist Church plantations at Ribe, Seyidie Province, who also showed some nice copra.

The fine fleeces of wool shown, the wool of one being valued at 1s. 2d. per lb., naturally appealed to us. This was from a pure merino ewe at the Government Stock Farm, Morendat, Naivasha. Against these were shown for comparison the fleeces of the third and fourth crosses between the pure merino ram and native ewes;

these certainly do credit to the breeders and show what excellent wool, as well as coco-nuts and coffee, the Protectorate can produce.

It was unfortunate that Mr. Powell's section was unable to compete for the TROPICAL LIFE medal for sisal, as their fibre is of good serviceable quality and colour, a bale from the Nyali Sisal Estates, Ltd., being particularly even in colour and cleanliness, whilst that from the Punda Milia Estates, East African Industries, Ltd., Maseno, Nyanza Province, Sisal Ltd., Makuyu, or the Government Farm at Mazeras, all show a high standard of quality. So did the cottons, but space compels us to pass them, concluding with a few lines on the Ceará rubber. We would, however, state that splendid samples of cotton are grown in the Juba River and Tana River valleys, and also on the shores of Lake Victoria Nyanza, and, provided the right class of men and sufficient capital are forthcoming the success of cotton production of high quality staple should be

assured. With Ceará, present prices are causing owners to rest their trees, but that the Protectorate can produce good rubber is borne out by the samples exhibited by the United Methodist Church Plantations, the Malindi Rubber Plantations and others. The exhibits of flax and flax products (linseed, &c.) show that this article flourishes in the Protectorate and is worthy the attention of those who, like ourselves, believe in cultivating more than one crop. Taken as a whole we found the mixed



The Court of the East Africa Protectorate at the Rubber and Tropical (1914) Exhibition.

exhibit of the East Africa Protectorate one of the most interesting in the Exhibition, and, judging by the constant stream of questioning visitors that kept Mr. Powell and his assistants busy whenever we passed their way, many others shared our opinion.

LIVERPOOL means to prove herself worthy of her Gladstone Dock, the largest shipping enclosure in the world. Having constructed this dock to take the largest steamer afloat, or at present being built, the Mersey Docks and Harbour Board have realized that the river-bed must be dredged to allow the leviathans to pass through the Mersey, and the determination of the river to form a bar at its mouth forced the Board to remove 21,000,000 tons of sand last official year, out of 204,000,000 tons of bed removed since 1890; this gives, in the dredged cut, a centre line 35 ft. deep at low water.

The Non-manuring of Coffee in Brazil.

"IN the Ribeirao Preto neighbourhood in Brazil," Mr. Wileman tells us in *M.A.C.* ("Mainly About Coffee"), "the crop this year is not only normal but the outlook is good; but this is exclusively so only on the plantations that have been well treated, which probably do not exceed 75 per cent. of the total. Yielding to the demands of their 'colonos,' most planters have had to consent this year to the interplantation of corn between the rows of coffee trees, with but very little manuring with chemical fertilizers." This, of course, is a short-sighted policy, as, given the right formula, both maize and coffee, even when planted apart, well repay an application of plant foods, but to grow both crops together and then to grudge the application of fertilizers is only to court trouble. "As for manuring with husks, no plantation yields enough during the course of a year to manure even one-fifth of the trees growing on it." On the other hand, "the quantity of phosphates imported into the Ribeirao Preto district last year was 1,100 tons, of which 700 tons were taken by one planter, leaving only 400 tons for the other 700,000 trees in the district." To show how badly the trees need manuring it is reckoned that out of 53,000,000 trees some 6,000,000 were poorly cared for, whilst another 6,000,000 are considered to be so neglected and stunted as to be nearly dead, and so unable to affect the output. Truly this is a case of being "penny wise and pound foolish."

This is a lesson that wants to be borne in mind by many planters outside the Ribeirao Preto zone with its 53,000,000 trees, for whilst the world finds that Sao Paulo puts out ample supplies of coffee, this is probably due to the new areas that are constantly being brought into bearing rather than to the old ones being cultivated and manured to keep them up to the mark, although there is no reason why they should be allowed to become exhausted through lack of having those plant foods put back that the crops remove and the ever-growing trees demand for themselves. Think of how much a bag of Sao Paulo weighs, and how many bags she turns out in a crop. We all know that Brazil, as a whole, has produced some 19,000,000 bags in twelve months, the bulk from Sao Paulo; realize, therefore, how many hundreds and even thousands of tons of potash, phosphates, nitrogen, &c., were exported for ever from Brazil in such a crop. How much, we wonder, was replaced; probably less than the bags themselves weighed that contained the coffee. If, therefore, the older established estates do not wish to be left out of the running and become "scrapped," they must manure, and do so judiciously and adequately, having careful regard to the needs of the plants and of the cost. Discussing the new coffee area now being opened up to Salto Grande, Mr. Wileman tells us:—

"The opening of the Sorocabana railway extension to Salto Grande, on the Paranapanema, has been the signal for an outburst of enthusiasm at Sao Paulo. The branch just opened to traffic starts from Botucutú, on the main Sorocabana line, and at present ends at Salto Grande, on the Paranapanema; thence, swerving to the north, it is being extended to Porto Tybiriça, on the river Paraná.

"The triangle composed between this stretch of the

Paraná and the valleys of the rivers Teite and Paranapanema, with its apex at Botucutú, comprises some 20,000 square miles of the best land yet available for coffee planting in South America and, in fact, the only really great reserve that the coffee industry has to count on for extension of consumption.

"Besides the Teite, this area is watered by the rivers Aguapehy, Peixe, Feio, and Anastacio, which flow into the Paraná. The soil is fertile and only to the south of the Paranapanema is it peculiarly liable to frost.

"Referring to the district between the rivers Feio and Paranapanema, Sr. Paulo de Moraes, the present Secretary of Agriculture, on the occasion of the opening of the Sorocabana branch to Salto Grande, described how, only five years ago, this vast region, now *the hope** of Sao Paulo, lay derelict and idle, the happy hunting ground of the few tribes of nomadic Indians that still exist on Sao Paulo territory.

"Only four years ago all that civilization had to show at Salto Grande was a few huts and one considerable coffee fazenda on the Paraná side of the falls. To-day the township of Salto Grande counts 250 brick houses, whilst fresh villages have sprung up at every station along the line. The new coffee produced in this and the new area on the Bauru extensions is already beginning to make its impression on crops, and accounts to some extent for the expansion of the current crop, for which due allowance has not been made.

"Until lately," Sr. Paulo de Moraes reminds us, "the Mogyana district had been regarded as the centre of coffee production in Sao Paulo. This centre, he believes, will before long be dislocated and the new area between the Teité and Paranapanema, with its hundreds of thousands of acres of virgin soil suited for grazing, coffee and cereals, become the centre of production in Sao Paulo. The importance of this extension of the Sorocabana can scarcely be over-estimated or the part it is destined to play in the maintenance of the supremacy of Sao Paulo as a producer of coffee. There is no fear of the production of coffee failing to keep up with consumption with this new reserve to fall back on and the introduction of more scientific methods of cultivation in the old." But the said scientific methods must include adequate manuring.

Rubber and Tea Costs.

THE celebrated Highlands and Lowlands Rubber Co., in their report to December 31st last, show a total output of 1,058,416 lb., or 157,508 lb. in excess of 1912. The average *net* price realized, including freight and all sale charges (2.39d. per lb.) was 2s. 5.87d. per lb. against the cost of production per lb. f.o.b. Port Swollenham 11.53d. per lb., but for Highlands and Lowlands Estate proper it was only 10.74d., and the "all in" cost 1s. 2.24d. The average output was 2 lb. per tree exactly, and the cost of tapping and scrapping for the whole estate 3.51 cts. per lb. or 7.02d. per tree. The Company paid 25 per

* Note these two words. Why should they be applied to Sao Paulo, with its immense output of coffee in the past; do they not denote exhaustion in the older established estates?

cent. dividend for the year, placed £10,000 to reserve, and carried forward £9,319.

The Consolidated Malay Rubber Estates secured an average yield of 3.61 lb. from 169,968 trees, at a cost of 1s. 0.061d. against 2s. 6.18d. gross price realized f.o.b. Port Dickson. The Anglo-Malay Rubber Co. cropped 1,346,008 lb. from about 3,000 acres, or 448 lb. per acre. The average gross price realized was 2s. 9.42d. per lb. against "all in" cost 1s. 3.16d. against 1s. 8.55d. last year. The Company declared 44 per cent. for the year, wrote off £21,346, placed £12,500 to the reserve fund, and carried forward £8,504.

The Sungei Krian Co. cropped 139,406 lb. rubber; "all in" cost 1s. 7.1d., against average gross sale price 2s. 6.2d., less freight and charges, &c., 2.2d., gives 2s. 4d. net sale price. The year having been an exceptionally wet one increased the cost in some of the items, or results would have been even more favourable.

According to the report of the Talgaswela Tea Co. (Ceylon: Messrs. J. J. Vanderspar and Co., agents), their tea crop was the highest yield the estate had given. They had had an excellent year for rubber, the crop, amounting to 149,574 lb., costing 78 cts. per lb., including 14 cts. per lb. for the upkeep of rubber not in bearing and for manuring. The average price realized was Rs. 1.71 per lb. A dividend of 55 per cent. was declared. The Sittgama Rubber Co. also spent 14 cts. per lb. on manuring, &c., 75,689 lb. Clovis Estate of the Ceylon Coco-nut Co., Ltd., gave 1,125,000 nuts for the 1913 crop, against an estimated output of 1,000,000, whilst as regards the number of nuts per tree, last year also established a record, viz., 59 nuts per tree, against 33 in 1912 and 36 in 1911. "It is well known," the Chairman told those present, "that the greatest difficulty the coco-nut planter has to contend with is the possible periods of drought which occur in almost all the coco-nut growing zones; and careful study of this subject has led to the knowledge that the adoption of a moderate form of dry farming as invented years ago by Jethro Tull is by far and away the best to adopt nowadays if one wants to try and prevent the ill-effects brought about by occasional droughts. The estate is in a high state of cultivation. Half of the bearing palms and half the younger generation of palms are all manured once every year, and the whole of the estate is worked with harrows and ploughs and is weeded regularly. The condition of the property naturally is very satisfactory, and perhaps a word of explanation is necessary as regards the way the crop has so very much exceeded the estimates. It is a very difficult matter to estimate crops of an estate where the crops are showing a gradual increase as the result of cultivation being carried out, and your directors think—very wisely—that it is better to put in an estimate they are absolutely certain of getting in than to put in a very high estimate which might not be secured. Turning to 1914, the prospects are, I think, very favourable. The crops for the first two pickings are again this year double what was secured for the same two pickings of 1913. But, of course, we cannot look for a continuance of such a high percentage of figures as we got for the first two months. . . . It is well known that unless you cultivate coco-nuts you will never work

an estate at a good profit. The old-fashioned idea was that, because coco-nuts are indigenous to Ceylon you had only to stick a plant on a felled piece of land and the trees will come into bearing. It is, however, the general experience of those who know, that to cultivate on thoroughly sound lines and to spend freely on cultivation is to reap the benefit in increased crops. The palms on this estate have improved in a wonderful manner since cultivation began. The crowns of the trees are heavy and luxuriant and the crops heavy."

The Great Western Tea Co. of Ceylon, which declared 17 per cent. dividend, secured the biggest crop on record for their last output, viz., 643 lb. per acre, against 630 lb. in 1912, and 602 lb. in 1911. During the season 398 acres were manured with artificial manure, whilst a second 398 acres were forked with basic slag and sulphate of potash, and 71 acres with cattle manure.

Compared with the above the question of the yield per acre of tea is discussed in some correspondence in the *Planters' Chronicle*, March 21st, 1914. One planter, we are told, established a field of three acres at an elevation of 2,000 ft. high, which gave 216 lb. per acre during the period of four years and six months, counting from the time of sowing. In another case a yield of 400 lb. of made tea per acre was obtained when the clearing was three years and six months from planting, and yet against this it is claimed that the average yield of tea per acre may be taken as about 140 lb. per annum. We feel, therefore, that the large yields of the Great Western Tea Co., or other gardens, must be due to judicious manuring and adequate cultivation, otherwise how can one account for such yields as 643 lb. per acre over a considerable area, against an alleged average yield of only 140 lb.?

As regards the cost of manuring, the fourth annual meeting of the Neuchatel Estates, Ceylon, which paid 24 per cent. dividend, showed that estate to have produced 591,041 lb. of tea at a cost of production of 25.75 cts. per lb., inclusive of 5.18 cts. per lb. for cultivation (and manuring); against this the net price realized was 42.29 cts. per lb. The Company produced 403,032 lb. rubber at a cost of 52.28 cts. per lb., including 16.52 cts. per lb. for artificial cultivation, whilst the net price realized was Rs. 1.82 per lb. Estimated crops for the coming year are 475,000 lb. rubber, to cost 54.63 cts. per lb., including 18.44 cts. per lb. for cultivation; and 550,000 lb. tea, to cost 25 to 78 cts. per lb., including 5.41 cts. per lb. for cultivation. The directors of the Kuruvita Rubber Co. estimate that out of a total expenditure of Rs. 10,602 some Rs. 2,934 would be required for manuring the 86-acre field. The growth of the rubber was all that could be desired, and as it was the intention of the directors to manure the rubber regularly they had no fear but that in due course the whole area would give remunerative yields. Discussing the vexed question of tea-cum-rubber, Mr. Joseph Fraser, the well-known visiting agent, is reported to have said: "Tea under rubber is being largely cut out, but with the generally more liberal manuring and cultivation of the tea areas and with the increasing areas coming into bearing there should be no falling off in the general output from the island." Those, therefore, who have been stinting their lands and trees should now manure them.

The London Produce Market.

Coffee.

OWING first to the Bank Holiday and then to the war, the produce markets have been closed since the end of July. Rubber sales were advertised for August 11th, but have since been postponed, and so were advertised for August 18th, but if possible we will delay this issue to try and include any prices realized, and also, we hope, to give news of other produce markets as well. Even at the end of July Messrs. C. M. and C. Woodhouse reported that the small supplies of coffee met with a slow demand, but prices were about unchanged. The grave situation on the Continent has caused a severe slump in the market for "futures" and, following forced liquidation from every quarter and a lower rate of Exchange, values have shown a heavy decline. September Santos closes at 34s. 3d., which is 8s. 7½d. lower for the week. We quote:—

		To-day	July 23rd, 1914
London ...	Santos, Sept. del. ...	34s. 3d. ...	42s. 10½d.
New York ...	No. 7, Rio ,, ...	6.68 cents ...	8.48 cents
Hamburg ...	Santos ,, ...	40 pf. ...	47¾ pf.
Havre ...	Santos ,, ...	50½ francs ...	59½ francs

The receipts at Rio and Santos from July 1st to 29th, 1914, were 1,026,000 bags, against 891,000 bags and 839,000 bags in the two previous years respectively.

Sales include the following, viz.:—

Uganda.—151 bags, at 57s. to 58s. for smalls, 64s. 6d. to 66s. 6d. for second size, 69s. to 70s. 6d. for bold.

Sumatra.—32 bags, at 50s. for Robusta.

Costa Rica.—375 bags, at 68s. to 75s. 6d. for fine ordinary to middling, 83s. 6d. for bold.

Salvador.—193 bags, 65s. to 65s. 6d. for smalls, 68s. 6d. for low middling, 73s. to 75s. for bold.

Nicaragua.—32 bags, at 80s. 6d. to 83s. 6d. for coloury bold.

Mexican.—54 bags, at 65s. per cwt.

Colombian, &c.—250 bags, at 68s. to 75s. for low middling to good middling, 74s. 6d. to 85s. for middling to fine bold.

During August the market seems to have been practically closed as regards spot business even, such reports as "small business doing at steady prices," or "transactions are small but business done has been at previous rates," being all the news we hear. Efforts have been made to open the "Future" market, but at the time of writing nothing had been done, but a further meeting was to be held to discuss the situation.

In accordance with the wishes of the trade the coffee market remains closed for "spot" and "future" business alike. Nominally prices are quoted thus:—

Coffee:	1914	1913
Jamaica, coloury ...	80s. to 118s.	75s. to 118s. per cwt.
greenish ...	68s. ,, 76s.	62s. ,, 76s. ,,
good to fine ord. ...	54s. ,, 72s.	58s. ,, 60s. ,,
East India, superior ...	90s. ,, 99s.	86s. ,, 100s. ,,
good to fine ...	80s. ,, 88s.	80s. ,, 84s. ,,
mid. to good mid. ...	72s. ,, 79s.	74s. ,, 78s. ,,
fine ord. to low mid. ...	61s. ,, 70s.	65s. ,, 73s. ,,
Mocha, long berry ...	83s. ,, 85s.	77s. ,, 79s. ,,
short berry ...	90s. ,, 102s.	80s. ,, 95s. ,,
Nyasaland, low mid. to		
good mid. ...	69s. ,, 73s.	65s. ,, 70s. ,,
bold ...	75s. ,, 78s.	74s. ,, 76s. ,,

Coffee (contd.):

	1914	1913
Costa Rica, good to fine ...	80s. to 93s.	80s. to 85s. per cwt.
middling ...	75s. ,, 77s.	73s. ,, 76s. ,,
ord. to low mid. ...	56s. ,, 73s.	56s. ,, 72s. ,,
Guatemala, foxy ...	54s. ,, 59s.	54s. ,, 57s. ,,
good ord. to mid. ...	60s. ,, 72s.	58s. ,, 68s. ,,
good mid. to fine ...	73s. ,, 83s.	70s. ,, 78s. ,,
Nicaragua, foxy ...	54s. ,, 59s.	54s. ,, 57s. ,,
fair to good ...	73s. ,, 80s.	70s. ,, 75s. ,,
medium ...	68s. ,, 71s.	64s. ,, 68s. ,,
Matagalpa, medium to fine		
bold ...	73s. ,, 95s.	68s. ,, 92s. ,,
Mexican, fair to fine ...	73s. ,, 83s.	70s. ,, 76s. ,,
low mid. to mid. ...	68s. ,, 70s.	62s. ,, 68s. ,,
good to fine ordinary ...	60s. ,, 66s.	58s. ,, 61s. ,,
Colombian, ord. ...	52s. ,, 54s.	54s. ,, 56s. ,,
good ord. to low mid. ...	58s. ,, 67s.	58s. ,, 64s. ,,
mid. to fine ...	70s. ,, 83s.	66s. ,, 84s. ,,
Vera Paz, grey ...	74s. ,, 78s.	73s. ,, 78s. ,,
good to fine ...	90s. ,, 108s.	80s. ,, 104s. ,,

Liverpool.

This market seems closed all round, except for Cotton, which on August 14th was reported as being inanimate for America, whilst middling was quoted 6.50d. per lb.

Rubber.

Coming to rubber we have had no detailed news since July 29th, extra sales (fourteen in number) having been held on July 27th to 29th in order to avoid having an auction on the day after the August Bank Holiday. The quantity offered was comparatively small, viz.: 424 tons (311 being Malaya, 96 Ceylon, and 17 tons Java) against 1,016 tons offered on July 21st, 1914. Messrs. Lewis and Peat's report was the only one we received of these now important auctions, since they were the last before the outbreak of hostilities. According to their report, prices at the opening of the sales were about steady against the close of the previous sale, except in the case of Smoked Sheet, which opened about ¼d. down. As the sale progressed, prices remained about the same, except for minor fluctuations, the auctions closing on the first day with Standard Crêpe selling at 2s. 1½d., and f.a.q. Smoked Sheet at 2s. 2½d. to 2s. 2¾d. The demand was fairly good and nearly everything was sold. Crêpe cured by the "Byrne" process, of which there was only a little on offer, was at about ½d. discount this sale, 2s. 1d. being the highest price touched, whilst some Sheet, in rather damp condition, sold as low as 2s. 0¼d. Highlands Smoked Sheet sold up to 2s. 4½d. Some good dark brown Ceará Crêpe sold at 1s. 9¼d., and pressed scrap Crêpe at 1s. 3¼d., whilst that day (July 29th) Standard Crêpe was valued at 2s. 1d. f.a.q., Smoked Sheet 2s. 2d. Against this Hard Fine is quoted 2s. 10½d. for spot; July-August and August-September at 2s. 10¼d.; September-October, 2s. 10d. sellers. Soft Fine, very little doing, sellers ask 2s. 4¼d. Scrappy Manaos, 1s. 8d.; Cametas, 1s. 3d. value.

Peruvian.—Fine nominal at 2s. 9½d. Ball easier, with sellers at 1s. 8d., buyers 1s. 7¾d.

Plantation.—The market after keeping about steady closes weak, with business in Crêpe done down to 2s. 1d. for spot; 2s. 0¾d. August; 2s. 0¾d. September; 2s. 0¼d. October-December; and 2s. January-March. Smoked Sheet also lower: August, 2s. 1¾d.; September, 2s. 1½d.; October-December, 2s. 1d. sellers. After this the market remained practically closed over

the Bank Holiday (August 3rd), when the following prices (being quite normal) were quoted: Standard Quality No. 1 Crêpe on the spot 2s. value; August delivery, 2s.; October-December, 1s. 11 $\frac{3}{4}$ d.; January-March (1915), 1s. 11 $\frac{3}{4}$ d.; January-December, 1s. 11 $\frac{1}{2}$ d. Smoked Sheet (ribbed) spot 2s. 0 $\frac{3}{4}$ d.; August, 2s. 0 $\frac{3}{4}$ d.; September, 2s. 0 $\frac{1}{2}$ d.; October-December, 2s. 0 $\frac{1}{2}$ d.; and January-December, 2s. 0 $\frac{1}{4}$ d.

Hard Fine Pará on the spot, 2s. 10d. value; July-August delivery, 2s. 10d.; August-September, 2s. 9 $\frac{3}{4}$ d.; September-October, 2s. 9 $\frac{1}{2}$ d.; and October-November, 2s. 9 $\frac{1}{4}$ d. Soft Fine, August-September and September-October delivery, 2s. 3d. value.

Reports on August 21st tell us that with a continued good demand from America a steady business has again been done in Plantation on the spot at firm prices, chiefly Standard No. 1 Crêpe at 2s. 5 $\frac{1}{4}$ d., with fine at 2s. 5 $\frac{1}{2}$ d., and fair to good ribbed Smoked Sheet at 2s. 5 $\frac{1}{2}$ d. to 2s. 6 $\frac{1}{4}$ d. For September delivery No. 1 Crêpe sold at 2s. 4 $\frac{1}{2}$ d.

Hard Fine Pará is also firmer, there being buyers on the spot at 3s. 1d. Soft Fine quoted nominally 2s. 5 $\frac{1}{2}$ d. Caucho Ball dearer, with buyers at 1s. 10d.

Later news tells us that quite a good business has been done on the spot in Standard No. 1 Crêpe at 2s. 0 $\frac{1}{2}$ d., and ribbed Smoked Sheet at 2s. 1d. to 2s. 1 $\frac{1}{2}$ d., the latter price being for good marks.

It has been decided for the present to indefinitely postpone selling by public auction, business meanwhile being conducted by private treaty.

The Pará market has been steady, but quiet. Hard Fine on the spot quoted 2s. 10 $\frac{1}{2}$ d., Soft Fine 2s. 4 $\frac{1}{2}$ d. Caucho Ball 1s. 8 $\frac{1}{4}$ d. and Manoaas Scrappy 1s. 8d.

Pará Rubber Statistics for the month of July (tons):

	Pará.	Caucho.	1914.	1913.	1912.	1911.
Receipts at Pará ...	1,060	280	= 1,340	agst. 2,120	1,940	1,420
Shipments to Europe	420	470	= 890	„ 950	1,320	1,150
„ „ America	790	430	= 1,220	„ 950	1,170	910

Crop statistics—June 30th, 1913, to June 30th, 1914 (12 months):—

	Pará.	Caucho.	1913-14.	1912-13.	1911-12.	1910-11.	1909-10.
Pará { 1913-14	29,330	9,800	39,130	41,950	39,360	37,500	39,130
Receipts { 1912-13	32,290	9,660					
„, Shipts. Europe	15,080	5,190	20,270	23,770	20,260	19,910	21,860
„ „ America	14,350	4,170	18,520	19,530	20,570	13,570	17,040

Coco-nut Products, &c.

No market reports have been issued since the end of July, when Ceylon Coco-nut oil stood at 35s. 9d., and pressed Palm oil at 33s. f.o.b., and Messrs. Mordaunt Bros. quoted values as under (on July 30th):—

Palm oil (Liverpool):	1914	1913	1912
Per cwt.			
Lagos ...	29s. 6d. to 30s. 0d.	33s. 3d. to 33s. 6d.	28s. 9d. to 29s.
Benin ...	27s. 6d.	30s. 9d. to 31s. 6d.	27s. 6d.
Congo ...	24s. to 24s. 6d.	28s. 3d. to 28s. 9d.	26s. 9d. to 27s.
Bleached ...	30s. 6d. to 31s.	34s. 6d. to 36s.	31s. 6d. to 32s. 6d.
Clarified ...	28s.	30s. 9d. to 31s. 9d.	27s. 9d. to 28s. 6d.
Palm kernel oil	35s. 9d.	45s. 9d. to 47s.	35s. 3d. to 38s.
Coco-nut oil:			
Cochin ...	50s.	59s. to 60s. 6d.	43s. 6d.
Ceylon ...	40s.	48s.	38s.
English pressed	34s.	None	34s. 3d. to 34s. 9d.
Copra oil:			
Ceylon ...	None	None	38s. 6d. to 39s.
Cochin ...	42s. 6d.	50s. 6d.	41s. 3d. to 42s.

During the week ending August 14th, the following items of news were published, mostly in the *Public Ledger*:—

Coco-nut Oil.—Ceylon spot, £50 hogsheads. London pressed, £43.

In London Ceylon Coco-nut oil has been firm and much dearer. Spot hogsheads sold up to £52, against £51 at this time last year.

Up at Hull *Linseed Oil* is unchanged. Spot and month fixed at 25s.

Cotton Oil.—Spot and month, 30s. 3d. paid and sellers. Crude: Egyptian spot 30s. 3d. paid. Bombay spot 28s. 9d.

Soya Bean Oil.—Spot and month fixed at 27s. 6d.

The *Copra* market remains inactive. There are buyers of Ceylon, c.i.f. Antwerp at £24 5s. Printed quotations, which must be taken as quite nominal, included the following:—

<i>Copra</i> , per ton c. f. & i.	£	s.	d.		£	s.	d.
Manilla	23	8	9	against	29	12	6 last year.
Ceylon	25	5	0	„	32	17	6 „
Malay and Straits	24	5	0	„	30	15	0 to £32 5s.
Java	24	7	6	„	31	17	6 in 1913.
South Seas ...	24	0	0	sellers c.i.f.			

Cotton.

OF Cotton we can give no news either in London or Liverpool, both the markets being closed down tight, and there they seem likely to remain until the banks can set financial arrangements in motion for trade to be reopened between the United Kingdom and producing centres. Turning again to the *Public Ledger* of August 15th (in the absence of any market report from Messrs. Slann and Davies) we find the following quotations:—

Cotton:	1914	1913
	d.	d.
Surat: Broach ...	5 $\frac{3}{8}$ to 5 $\frac{1}{2}$	5 $\frac{3}{8}$ to 6
Sawginned Dharwar ...	4 $\frac{2}{3}$ „ 5	5 $\frac{3}{8}$ „ 5 $\frac{1}{2}$
Madras: Tinnevely ...	5 $\frac{1}{2}$ „ 5 $\frac{3}{4}$	5 $\frac{1}{8}$ „ 6 $\frac{1}{8}$
Western ...	5 „ 0	5 $\frac{1}{8}$ „ 0
Coconada ...	4 $\frac{7}{8}$ „ 5	5 „ 5 $\frac{1}{8}$
Salem ...	5 $\frac{3}{8}$ „ 0	5 $\frac{1}{8}$ „ 0
Bengal ...	3 $\frac{7}{8}$ „ 4 $\frac{1}{4}$	4 $\frac{1}{8}$ „ 5 $\frac{1}{8}$
Scinde ...	4 „ 4 $\frac{1}{4}$	5 $\frac{1}{8}$ „ 5 $\frac{1}{8}$
Australian ...	0 „ 0	0 „ 0
Tahiti and Fiji ...	0 „ 0	0 „ 0
American Sea Island ...	9 $\frac{1}{2}$ „ 5	12 $\frac{1}{2}$ „ 10
West India ...	7 „ 8 $\frac{1}{2}$	6 $\frac{3}{4}$ „ 8

Sugar.

COMING now to Sugar, this article has doubled and more than doubled its value. On the first outbreak of the war, sugars at 1 $\frac{3}{4}$ d., 2d., and 2 $\frac{1}{4}$ d. per lb. all jumped up to 5d. and even 6d. per lb., but on affairs settling down and the Government intervening, these rates were reduced. The Sugar market, the *Public Ledger* reported on August 15th, has been demoralized during the past fortnight owing to the grave crisis pending in Europe, the August position of Beet being especially affected, the price of which rapidly declined to the extent of 3s. 9d. to 5s. 3d., whilst the expectations of large tenders and the prohibition of exports from Germany caused great consternation. On the declaration of war the market for all Continental free on board Sugars was closed and contracts were then settled on the basis of the war clause. The spot market for foreign white sugars, owing to a scarcity of supplies, became strong and prices advanced considerably. Subsequently, on the Home Office fixing the retail prices,

and with our refiners offering, quotations gave way, but on balance prices are appreciably dearer. Grocery Crystallized has been in good request and prices are considerably higher. Business done includes the following. Readers to realize the importance of the rise should compare these prices with those printed in our July issue:—

British West Indies.—Crystallized: Demerara, good to fine, bought in at 31s. to 33s.; Trinidad, low middling to good, bought in at 29s. to 30s. Jamaica, middling to good, bought in at 30s.; 575 bags Crystallized Demerara fine yellow sold at 31s. to 31s. 6d., being fully up to private rates.

200 bags Crystallized Demerara sold at 31s. to 32s., 9,000 bags Trinidad 27s. 6d. to 30s., 2,000 bags St. Lucia 30s., 1,500 bags Mauritius up to 28s., 780 bags Antigua 23s. to 25s., 300 bags Surinam 25s., and 1,200 pockets Guatemala 25s.

The speculative Beetroot market on the 1st inst. was panicky, especially for August delivery, which gave way to the extent of 3s. 9d., the price touching 5s. 3d., being the lowest on record. New crop on the other hand was fairly steady at a decline of 2d. to 2½d. August sold at 9s. to 5s. 6d. to 5s. 7½d. to 5s. 3d. to 5s. 6d. to 5s. 3d. and buyers, September 9s. 3½d. to 9s. and buyers, October 9s. 5¾d. to 9s. 3d. and buyers, October-December 9s. 6d. to 9s. 4d. and buyers, January-March 9s. 8½d. to 9s. 6¾d. to 9s. 7¼d. and sellers, May 9s. 10½d. to 9s. 8½d. and buyers f.o.b. Hamburg. But all that is now out of date.

The London Cocoa Market.

By the EDITOR.

WHILST no one has any doubt as to the wisdom and justice of England's joining in the European mêlée, many are in a state of doubt as to the exact result that the war will have on the price of cocoa. "It will go up heaps," says one importer in an emphatic manner that expected no contradiction; for all that, the denial came, and from those who argue along the lines of Mr. Broodbank in the footnote on the first page of this issue that the closing of the Continental ports will force produce, including cocoa, to come to London, and that this will naturally pull down prices. These two opinions faced each other at the opening sales on August 11th, after the Bank Holiday break, when bids of 55s. or 56s. was made for fine Grenadas that were held for 62s. or 63s., sales having been made privately of this growth during the interval at that figure. At the time of going to press, the dispute was still going on. Owing to the interruption of the postal service, mid-August found us without any figures from Lisbon, Guayaquil, Havre, &c. The absence of the "*Gordian*" of Hamburg makes us realize how very dependent this country is on that paper for statistics, which are certainly interesting to discuss, if nothing else, and the way in which they are reproduced by our own journals in all parts of the Empire interested in cocoa, makes me wonder why steps have not been taken to draw up and publish similar tables of figures in England, and not leave us in this, as in other matters, dependent on Germany for our information. TROPICAL LIFE would be most pleased to receive and promptly publish every month

the output, or the export, of cocoa from each of the producing centres, both large and small; and were these centres to take steps to enable us to do so, they would get a considerable amount of publicity, far more than they do at present, among the large manufacturers and others who receive this paper regularly, and it is always good to be kept before the eyes and minds of buyers, whether the cocoa be raw or manufactured, and no one knows this better than the large manufacturers themselves. If they find it so useful that they spend hundreds of thousands of pounds sterling a year in advertisements to keep themselves before the public eye, I am quite certain that it is *more* than worth while for the centres producing the raw cocoa to place at our disposal the means of keeping them before the large buyers at no cost at all except to keep their figures up to date and wire them across once a month.

Leaving the centres to digest this, I will give such news as has come to hand at the time of writing, and that is not much. The West Indian mail on August 2nd came in to time, and showed that Trinidad for the first time on record had exceeded 300,000 bags in its crop year October-September, and in this case it had done so by July 18th, so that there is still nearly two and a half months, or over one-sixth of a year, to run. As the record year exported only 293,886 bags during the twelve months, the above shipment is worth noting, especially when one thinks of all the complaints that have been hurled at the "Clerk of the Weather" by the planters during the whole of this crop-year. Grenada, which was less noisy in its grumblings, is now really behind, having so far put out 64,271 bags, against 68,634 between October 1st and July 20th in 1911-12—that is two crops ago.

Coming to the question of consumption, the Board of Trade figures to the end of July work out as follow:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (July 31st Tons.
Jan.-June, 1912—	22,015	15,629	3,586	12,262
" 1913—	22,717	16,500	4,346	10,572
" 1914—	27,005	17,693	4,206	14,925
	Incr. 4,288	Incr. 1,193	Decr. 140	Incr. 4,353

In July only 2,078 tons were delivered for consumption, against 2,221 tons last year, and 2,037 tons in 1912.

Foreign Manufactured—	Landed.	July only Del'd H.C.	Jan.—July. Landed.	Del'd H.C.
1914	878	887	6,175	6,159 tons
1913	760	729	5,759	6,370 "
1912	774	799	5,189	5,387 "

London Stock, August 15th—	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads	10,653	11,885	6,872
Grenadas	9,797	5,694	6,687
Other W.I.	5,603	4,433	14,313
British Africa	11,498	12,251	7,672
Portuguese Africa	3,556	4,067	9,441
German Africa	2,146	2,778	6,974
Ceylon and Java	10,898	16,827	15,329
Guayaquil	25,940	13,618	41,503
Brazil and Bahia	2,036	374	3,363
Other Foreign	13,493	9,509	9,903
Totals	95,620	81,436	122,057

These are all the figures I can give this month. As to general market news, it is very difficult to speak

with certainty as to what is going on. Sales privately of Grenadas up to 63s. have caused sellers to put that as the value of the best marks of this growth, but up to now I have not heard of any general business in this growth at that price, and buyers at the sales on August 11th, and also on the 18th, showed no inclination of placing any bids on this basis, whilst, so far as I can ascertain, the valuation of the best kinds have been put at 57s. to 58s. Trinidads were bought for the Government at 59s. for fine good red, before the holidays, and at 62s. on August 11th, when they purchased over 1,000 bags. Taking the market generally, and allowing for this rather exceptional business on the one hand, and for those who are holding aloof of, or talking down the market on the other hand, I would place values as follows, but it must be borne in mind that the prices are more or less nominal, and no planter can rely on securing them unless the class of cocoa that they have to sell is wanted.

Trinidads.—Mid red, 59s. to 60s.; good mid to fine good red, 60s. 6d. to 61s. 6d.; fine to superior marks, 62s. to 64s. (nominal).

Grenadas.—Private sales are spoken of up to 63s., but at public auction none sold on August 11th, although nearly 1,000 bags were offered, and bids seem to have ranged no higher than 55s. 6d. Reliable valuations still only place the top value for "open sales" at 58s.

Jamaicas continue to do well. Before the holidays good red sold at 55s. 6d. to 56s., and since then fine marks went at 58s. 6d. The common grades seem to have been left alone; at any rate, I know of no business having been done in them.

St. Lucias, in the absence of business, are quoted at 51s. to 57s., but such values, as well as those for Dominica, must be taken as purely nominal for the time being. The next sales, as with Grenadas, may be at over 60s., or it may go at only 55s. or 56s. for the best marks; the latter is most likely.

Dominicas.—Ordinary unfermented to good fermented are valued at 50s. to 56s.

British West Africa.—We hear of no business in London, where quotations for fair average quality range from 50s. to 53s., but as the Liverpool market persists in keeping closed, I can give no news of actual sales.

San Thomé is put at 57s. to 58s. (nominal).

Guayaquil.—A considerable amount of business has been done in this hitherto somewhat lifeless market, and several thousand bags have in the aggregate changed hands, including Winter Arriba at 56s., and Machala at 55s., then followed sales of Caraquez and Machala at 56s. to 58s., whilst up to 66s. was paid for summer Arriba. At the sales on August 11th some 261 bags Caraquez sold at 56s. 6d. to 59s., which is considered to show a further advance of 1s. to 1s. 6d., but the latest news speaks of easier rates.

Ceylon sales have been very restricted, especially for fine grades. Good bold was held for 78s. to 80s., following on sales of nearly as good at 74s. to 78s., but fine marks could sell at anything up to 90s., I believe, if here.

The Lisbon figures have just come in. Stocks on July 31st were lower, say, 51,945 bags against 62,920 on June 30th.

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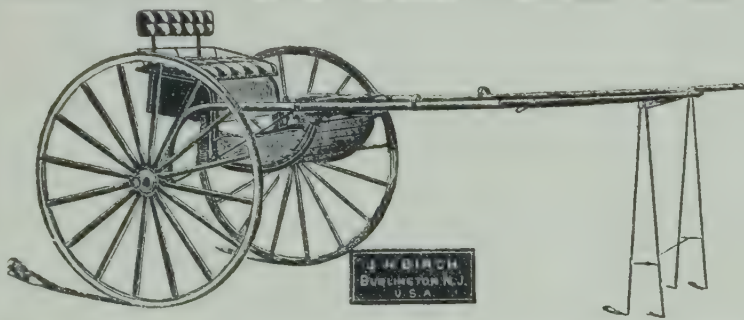
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The Tropics and the War.

"MANY INDUSTRIES ARE NOW DOING VERY WELL INDEED."

THESE are hustling times to us all. The military aristocrat and the journalistic *gamin* in "the street called Fleet" have both been striving hard, the one to help his army keep uppermost, and the second to keep himself going; but for all this struggle that many have been pitched into without any notice, we have not met one, aristocrat or *gamin*, that is not equally anxious to help some one whom he believes to be in a worse plight than himself or herself.

As regards ourselves it will be noted that no names are missing from our columns, and next month, or by November or December at latest, we hope those now present will have been considerably added to. If the Prime Minister, as far back as September 4th, in the course of his historic speech at the Guildhall, when the Germans were before Paris, was able to tell us that in his judgment, "in whatever direction we look, there is abundant ground for pride and confidence," we feel certain that the position of this country as regards its world-prestige, its financial position, its commerce and agriculture, will stand on a higher plane than it ever occupied before, whilst its chief opponent not only stands disgraced before the whole world, but even its own leading authorities, discussing the extent to which German industry has already (September 5th) been hit by the war, tells us it has "smashed (German) industry to atoms."* Compared with this it is interesting to note that the Chancellor of the Exchequer, speaking on the Financial Position in the House of Commons on Monday, August 31st, told members present that "The British mercantile marine was sailing freely throughout the world. He was confident that with patience British trade would go on booming in a very short time. This (the United Kingdom) was the only manufacturing country now in Europe, and there was no reason why our manufacturers should not go to every market in the world." This being so it is only a matter of time before our family circle, *i.e.*, the friends who have been with us since we started, are not only with us again but their number considerably increased.

Meanwhile, as Mr. Robert Bridge, of Messrs. David Bridge and Co., Ltd., suggests we should do, we invite our readers who do not find all they require in the pages of this somewhat curtailed issue to communicate with us, giving details of their requirements, when we will do our best to place them in communication with those firms who can supply their wants, whether they

* Dr. Emil Lederer, in the *Vossische Zeitung*. See *The Times* of September 7th, p. 3, col. 3.

require machinery, agricultural implements, manures, or anything else. Some goods which can no longer be exported from here or the Continent are still obtainable abroad, and so, wherever possible, we have communicated with the agents abroad—in New York, Cuba, Sydney, South Africa, Calcutta, South India, &c., asking for news, and as soon as the replies are received we shall publish them.

The greatest trouble has been concerning the demand for potash, the position of which is discussed in the following article together with the remedy. It is not the place for a journal such as this to discuss which flag should fly over the various centres where potash is produced; all we ask is that as soon as possible the Russians on the one side, or the Allies on the other, shall allow the potash to be exported, as it is as necessary for the crops abroad, as the crops, or at least some of them, are for the armies and the general public over here. If we must have cereals and flour to feed our soldiers and ourselves, in the same way we must have potash to feed the cereals and other crops.

In other departments we are glad to note that, having got over the first shock of the financial disruption caused by the war, our readers are re-ordering. During the first week in September we received inquiries concerning stump-pullers, pumping-machinery and drying apparatus, and in every case were able to handle them satisfactorily. As can be understood, except on account of our technical knowledge, as we do not expect to have the inquiries sent to us, we feel that to each one we get our advertisers must be receiving twenty, and so are busy again. This opinion is confirmed by letters to hand; one advertiser writing in reference to the first article in our August issue says: "As regards ourselves, we mean to capture every penny worth of the trade that we can, and your journal can render invaluable aid to ourselves and others to do so, on account of your practical knowledge of the overseas trade." Our well-known contemporary, *The Engineer*, in a letter just to hand, concludes by saying: "It is very encouraging to notice that trade quickly recovered from the blow of the outbreak of the war, and that many industries are now doing very well indeed."

In conclusion, should the issue find its way into the hands of one who is still despondent, we beg to offer him this advice. Nail up in front of you the words that Queen Alexandra, when visiting the wounded soldiers at the London Hospital, found fastened above the bed of one of them, which ran thus—"If you feel down in the mouth, remember Jonah. He came up all right." We are not even uncomfortable, but were we to be in as great a pickle as are our enemies to-day, we, like Jonah, would still come up all right, for like his whale, being surrounded by water, coupled (be it remembered) with the determination of the individual not to go under, will pull this country out of a greater upheaval even than she is going through to-day, and although many have suffered, and still are suffering, from shortness of money, they must feel with Mr. Asquith that we have abundant ground for pride and confidence. If this was so at the beginning of September, we leave it to our readers to realize their position when reading these notes, but it is worth noting that on the same day that the first German War loan was reported to have received no response from

abroad, a small matter like the London Water Board's loan for £1,000,000 was covered more than five times over. This unwillingness of the banking world to do anything that will prolong the struggle, and through that the present stagnation of business, must go a long way to bring the war to a critical and final stage.

The Question of Manure Supplies.

WE have had a large number of inquiries from firms this side of the water *re* the output of potash, nitrate of soda and other manures, the writers wishing to know:—

(1) Can we get supplies from the local agents near our estates?

(2) Will further shipments go out from the mines?

(3) Will prices be changed to any important extent?

In reply to the above we have written to the agents abroad to ascertain what supplies they have, and how long these will hold out. Of potash we can give no news, except that no supplies can be obtained from the mines until the conclusion of the war. This, we believe (touching wood to avoid ill-luck befalling the Allies for saying so), cannot last very long, but until the mines are working again we can only refer our readers to the advice given further on, as how to make up, by local supplies, the deficiency from the mines in Europe. Regarding nitrate of soda, however, there is no shortage at any of the depôts, and those likely to need supplies in the near future would be wise to place their orders freely at once before hostilities cease, for directly the war is over the demand from Europe alone to make up for lost time will be enormous. Should the war last only another three months even, it will be at least as long again before orders will be given out, and then from 500,000 to perhaps 750,000 tons may be bespoken for European use, with the result that prices during the rush must increase, as has been the case with potash where sellers have got caught without supplies. By the time our October number is out we shall have heard from the various depôts and agents overseas, and can then inform planters where, and to what extent, they can rely for supplies of potash, and the price it is likely to cost. Two of the potash mines are in Alsatia, but whether supplies can be obtained from them sooner than from the chief centres in Germany remains to be seen. It is certainly important for planters that supplies should be got out as soon as possible, and we feel sure that the Allies will do all they can to help the planters in the Tropics who have rallied so splendidly to help them.

Meanwhile we noted with interest, a little time back, the issue, for the eleventh year, of Mr. Brodie James's interesting booklet, "Nitrate Facts and Figures."* This contains the usual interesting matter for shareholders and others interested in Chilean nitrate of soda, whilst two new items are added, viz., the average price of nitrate f.o.b. Chili for the past seven years, and the highest and lowest quotations and dividends of the English companies for the past six years. In his preface Mr. James states that the recent Restriction of Production did not produce the result anticipated,

* "Nitrate Facts and Figures." (New Edition.) By Mr. Brodie James, F.S.S. Price 2s. 6d. net. Fred. C. Mathieson and Sons, 16, Copthall Avenue, London, E.C.

and is not likely to be repeated. We presume that the result anticipated was a reduced output, and it seems evident that if nothing had been done there would have been an increase equal to the amount restricted, say, 2,000,000 quintals, more or less. As to the likelihood of a repetition of the restriction, the present state, not only of Europe, but of the whole nitrate-buying world, renders one unable to offer any opinion. The enormous requirements that Europe alone needs, being completely checked, *pro tem.*, will of itself greatly restrict the output from the mines, so we must now sit up and wait for peace to see what orders are sent over the wires directly the armies are broken up and the merchant, the land-owner, and the tiller of the soil return to their work.

Discussing nitrates reminds us that those who are suffering from a curtailment of their supplies of potash, the absence of which is likely to continue for some little time, will do well to remember the great part that the soda content of nitrate of soda plays in freeing the potash in the soil, and making it available for absorption by the growing crops. Various papers interested in agriculture have been calling attention to this, and directly the trouble started on the Continent the Board of Agriculture, now one of the most wide-awake of our departments, called the attention of agriculturists to the experiments carried out at Rothamsted and elsewhere which proved that soda has the power of liberating potash in the manner described; and with mangolds and barley the beneficial action arising from the use of soda has been most marked. We believe it was Dr. Russell who, in his book on 'Fertilizers and Manures,' told us that "for twenty-five years the use of nitrate of soda alone has enabled the soil to supply a mangold crop with the large amount of potash it needs." Since this is so, the amount of nitrate of soda applied to areas under crops in the Tropics will undoubtedly be increased, and those who have not yet made use of this means of increasing their supply of available potash in the soil will do well to do so. Meanwhile, of course, the ash of any rubbish that is burnt, as on coconut, cacao and other estates, must be preserved for use as occasion demands, and not merely left on the ground as is generally done. Nowadays all wise planters "clear up" and burn regularly once a week, if not oftener, and those doing so will find that quite an important quantity of ash can be collected for mixing with other fertilizing material. Those who cut down or grub up their cotton plants to avoid the carrying over of pests, who cut out prickly pear and other proscribed weeds, or who heavily prune their tea plants, will certainly be able to secure a considerable quantity of ash that will be quite valuable in these days.

For the above reasons, therefore, we have included on p. 164 the important paper read by Mr. Kelway Bamber before the Low-Country Products Association in Ceylon, in which he gives us definite figures as to the large proportion of potash a coconut palm extracts from the soil (228 lb. to 320 lb. of ash, chiefly potash salts), and that the greater portion is found in the leaves, which, unlike the crop, remain behind to be utilized over again. Again we are told much of the potash was to be found in the immature fallen nuts, further indicating the manurial value of "waste" on a plantation.

Cacao Cultivation. No. XXXII.

THE DISCUSSION AT THE THIRD INTERNATIONAL CONGRESS OF TROPICAL AGRICULTURE (LONDON, 1914).

THE question of improved methods for the cultivation as well as the preparation of cacao came up twice for discussion at the above Congress: (1) On Wednesday, June 24th, under "Legislation against Plant Diseases and Pests," with Sir Sydney Olivier, Permanent Secretary to the Board of Agriculture (in London) and ex-Governor of Jamaica, in the chair; (2) on Friday, June 26th, under Section IV, devoted to cacao and tobacco, with Sir Hugh Clifford, Governor of the Gold Coast, ex-Colonial Secretary of Ceylon and Trinidad, in the chair, and on both occasions, so far as time allowed, it received full justice in comparison with the importance of the subject. There is no doubt, too, that had it been possible on either of these occasions to extend the time, advantage would have been taken of the opportunity to have threshed out several knotty and debatable questions, especially on three points, viz., the fermentation of cacao; the restriction of outbreaks of plant diseases and pests within limited areas to enable the trouble to be dealt with before it had time to extend to the neighbouring fields and estates; and thirdly, the interchange of plants and seeds between the various centres and how to avoid their introducing disease or pests into the importing centre by means of regulations which, whilst being thoroughly efficacious, would not bear too heavily on the cost, either to the seller or exporter at the one end, or buyer or importer at the other. Such was the interest shown in the papers brought forward on June 26th, that instead of stopping about 4 p.m. to allow Mr. McCall, Director of Agriculture, Nyasaland, to read his paper on "The Production of Tobacco in Nyasaland," that gentleman kindly allowed the discussion to be continued.

We mention these details as they show the importance attached to the production and preparation of cacao by those attending the Congress, and this being so we feel that when the delegates go back each to their own centre they will have much that is new and useful to pass on to the others, and since the audience contained several directors of agriculture, they are very capable of making good use of all that was said.

As on both occasions we preferred to hear what those just over from the various producing centres had to tell us instead of speaking ourselves, we did not take part in the debates, but now put in print what we should have said on the various points raised had we spoken.

Regarding the interchange of plants and seeds between the centres, and certificates as to the freedom of plants from disease or pests, we hold that such certificates are only efficacious when issued by the official appointed to inspect and fumigate and otherwise disinfect the plants at the *importing* centre, for no one can say where the plants may go, or what company they have kept since leaving the centre of origin. They may contract disease on board, or at some *dépôt en route* if they have to be transhipped and kept until the second vessel can take them along. We say this because we have known of plants held up in London for a week or so that were placed in a glasshouse infested with blight, and if this was so in one instance it could very well be so in another. What good,

therefore, would a clean bill of health be to the importing centre if the plants are allowed to get mixed up with such bad company either through carelessness or ignorance. Most certainly we should say: Do not trouble about inspection or disinfection until the plants or seeds arrive at the importing centre, except on one point, viz., centres known to be troubled with pests or disease either permanently or temporarily, must, as with human diseases, be placed under quarantine, and the export of plants or seeds from such centres should, by international agreement, be prohibited until the quarantine is removed. If a shipment had left immediately after the trouble was officially notified, then the packages, again like people, must be isolated on arrival until the agricultural officials are certain that they can do no harm to the crops already established at the importing centre.

This naturally leads one to use the term "approved centres," by which we mean, as Professor Carmody, of Trinidad, said, when referring to Dr. Van Hall and Surinam, such is the confidence one can place in the officials of certain departments, that if they tell you the plants left in good order and free from disease or pests, you could feel quite safe in allowing them entry elsewhere, provided, we maintain, you are certain that they have not got into bad company in the journey across, but this is by no means the case with all plant or seed-exporting centres. The whole controversy and the restrictions already in force, and which are likely to be strengthened, causes estate owners at each exporting centre to ask, however, "What can we do to make our estate, and our producing centre generally, an 'approved centre'?" To this we would make the following addition to the precautions already taken.

Owners and authorities alike ought to agree that not only must every estate, or at least the planted area of every estate, be isolated from its neighbour, but estates of over 300 or 500 acres (or whatever area is agreed upon) should in turn be cut up and have isolation belts round each section. Most certainly should a stop be put to the practice at many, and perhaps most of the older centres, of allowing the trees or shrubs to be planted in such a way that even the owners cannot tell, except by checking their boundaries, which trees are theirs and which are on the next estate. When an area is planted up on such lines, should trouble start it is difficult, if not impossible, and certainly very costly to prevent its spreading right through the entire producing centre, as was the case with canker in Trinidad or the witch-broom disease in Surinam. The isolation belts should preferably be a bare (or practically bare) strip of land like a road, for although a crop, said not to be a conductor of trouble between two fields of cacao, rubber, &c., may be planted, the clear strip is more likely to check any trouble long enough to allow the attentive owner or manager to apply the remedy from the outer edge and drive it in, like a fire, towards the centre until a complete spraying, pruning, or even a burn-out (as in bad cases) has been effected. Such a treatment could not be applied when the estates or fields interlock each other without roads or paths between, as many at present do. Precautions such as these, when known to exist at centres which lay themselves out to export seeds, seedlings or stumps, would soon cause such places to be classified as "approved centres."

(To be continued.)

Cult of the Coco-nut.

THE TREATMENT AND MANURING OF THE PALM.

Mr. KELWAY BAMBER read the following interesting paper before the members of the Low-country Products Association. His Excellency the Governor showed his interest in the question, which concerns a growing industry of the country, by presiding over the gathering. We attach so much importance to the information given that we have reprinted the following word for word as it appeared in the *Times of Ceylon* of July 3:—

"Before discussing the treatment of manuring of the coconut palm, Mr. Kelway Bamber dealt briefly with the various types of soil and the climatic conditions under which it thrived. In several countries, including Ceylon, the area over which the palm was grown had extended inland many miles from the sea, and it was now grown over large areas at elevations up to 1,600 feet on soils totally different, both physically and chemically, from those found on the sea coast. In Ceylon it was generally grown on sands varying from pure white, as seen in and around Colombo and Batticaloa, to the dark grey reddish sands of the Chilaw and other districts. Further inland, it was also frequently grown on alluvial banks of rivers, where it did well, and on cabooky soils, which formed the rising ground in most of the Low-country plantations. In the Malay States, where the palms grew, some of the soils contained from eight to fifty-five times as much nitrogen as Ceylon sandy soils, and ten to sixty times more potash.

The climate of the coco-nut district varied in different parts of the Island. After referring to the rainfall statistics, the speaker went on to say that the sandy soils of Ceylon were usually found near the sea coast, but they also occurred in the low-lying portions of slightly undulating estates for many miles inland, and were formed by the breaking down of the cabooky soils, the finer clay being washed away to the rivers and sea, and the sand collecting when the downward flow of water was temporarily checked. The cinnamon soils, consisting of almost pure white sand, were the poorest, and contained little available plant food, and although coconuts would grow in them, they would hardly yield remunerative crops until heavily cultivated and manured. The yellow, grey, and reddish sands were usually a little richer in plant foods, but even those might be classed as poor from the chemical point of view, and it was remarkable in many instances how good yields were obtainable from such soils. They consisted of 93 per cent. of sand and 0.311 per cent. of plant food altogether. Some of those soils were too poor even to grow grass for grazing purposes, and it was only by the enormous root development of the coconut palm through a large area that it could obtain sufficient nutriment for a healthy leaf growth and fruit production.

It has been estimated by Lepine and others that a 30 year old coconut palm formed 2,240 lb. (or 1 ton) of organic matter during that period of growth, and absorbed from the soil from 228 lb. to 320 lb. of ash or mineral matter, consisting chiefly of potash salts, phosphate of lime and other lime salts, with a small proportion of sodium chloride and silica. The greater portion of the potash and phosphate of lime was to be found in the leaves or about 56 per cent. Most of that was returned to the soil when the leaves dropped off, and it showed the importance of utilizing mineral matter in

the fallen leaves to the best advantage. Much of the potash, but little of the phosphate of lime, was to be found in the immature fallen nuts, and there again the advisability of utilizing them as manure was indicated. The amount of mineral matter estimated to be removed from the soil by one acre of coconut palms annually, at 62 palms to the acre, was said to be, salt 52 lb., potash salts 321 lb., phosphate of lime 194 lb., carbonate and sulphate of lime 140 lb., magnesia 2 lb., and silica 28 lb., a total of 737 lb. The leaves and fallen fruit removed most, 370 lb. and 250 lb. respectively, while the trunks utilized 70 lb. and the remainder 47 lb. Those figures showed the importance of including a good proportion of lime, potash and phosphoric acid in a manure mixture even for the growth of the palm, especially if the soils were deficient in those constituents.

Apart from the composition of the palm itself the question of its remunerative cropping had to be considered. Several comparative analyses of the nut and husk had been made by Lepine, Bachoffen, Rideau, and others, and the following might be taken as an approximate average: husk 53 per cent., shell 12.6 per cent., copra 18.5 per cent., water 13.5 per cent. The large amount of salt and potash in the husks was noticeable and pointed to their value as manure. A candy of copra contained 5.27 lb. of potash, 2.03 lb. of phosphoric acid, .87 lb. of sulphuric acid and 50 lb. of salt, so that an average crop of 50 nuts per palm, giving, say 3 candies of copra per acre, would remove from the estate nearly 16 lb. of potash, 6 lb. of phosphoric acid, and about 11.7 lb. of nitrogen, the nitrogen content of copra being about 0.7 per cent. To replace that in manure would require the application of a mixture as follows, applied every other year: sulphate of potash 32 lb., bone meal 27 lb., and ground nut cake 107 lb., total 226 lb., or say $3\frac{1}{2}$ lb. per palm. To apply such a small quantity to large or old palms would be absurd, and it had been found in practice that at least four or five times that amount, or say 12 lb. per palm, was required to render manuring profitable.

It was very evident, however, that manuring as carried out at present must gradually and steadily result in an accumulation of plant-food in the soil, if full use were made of the cropping fronds, immature nuts, &c. The question of the use of soluble or insoluble manures on common cabooky soils was an important one, and experiments were being conducted to prove their respective values.

After describing the root of the coconut tree, Mr. Bamber said that when the tissue of the root was cut through, the cut surface dried and shrivelled and new roots sprang at right angles to the original ones, so that any temporary injury from ploughing or cutting circular trenches round the palms when applying manure was soon remedied. The idea that the cutting of the roots by digging or ploughing was harmful was, he thought, a mistaken one, though it should not be done at the beginning of the dry weather. By frequent disturbance of the surface soil the roots were driven downwards so that such palms were least affected by drought. In the Peradeniya experiments, ploughing the soil twice had a very marked effect on the old palms, and the younger ones also greatly benefited by stirring the soil monthly with disc harrows. At Maha Illuppalama, in the dry zone, the effect was even more marked, the growth of the

palms being very fine owing to their cultivation by means of disc harrows. As in sandy soils there was little retentiveness of chemical salts and at the same time the formation of leaf and flower stalks was practically continuous throughout the year, it would also appear desirable to apply small quantities of manure at frequent intervals to obtain the best return rather than larger applications every second year. On the other hand, the good effect of tying cattle to the trees for an occasional fortnight would tend to show that the soluble salts were retained and the effect was more prolonged than the nature of the soil would lead one to expect.

The general practice of applying manure had resulted in greatly increased yields, especially after the second application: still it remained to be seen whether frequent small applications of concentrated soluble manures would not give more rapid and equally satisfactory results. The results so far obtained at Peradeniya on old palms rather pointed to that conclusion. A good deal of the first application of manures went rather to increase the general vigour of the palm than to increase the crop and for that reason it was advisable to make the first mixture rather more nitrogenous, though if a good proportion of phosphates were given as well the crop should also improve.

Mr. Bamber then discussed the method of applying the manures, especially with reference to backward estates. The chief thing, he said, was to prepare the soil before they applied the manure. Good drainage was essential for all soils, but the presence of ample moisture was of more importance than manure, as no amount of the latter could counteract the immediate and after-effects of a long drought. In the Peradeniya experiments, ploughing the soil twice had a very marked effect on the old palms and the younger palms also greatly benefited by stirring the soil monthly by disc harrows. At Maha Illuppalama, in the dry zone, the effect was even more marked, the growth of the palms being very fine as the result of cultivation by disc harrows. Those latter experiments have demonstrated the value of irrigable lands in the North-central Province for coconut cultivation and that far less water was required than for paddy where a thorough system of surface cultivation was adopted.

It was unnecessary, continued the speaker, to enumerate the manures now available for coconut cultivation, but he went on to deal with their properties and stability for various soils. The main points to be borne in mind when manuring were: first, to apply a manure suitable to the soil requirements and of a composition that would encourage yield and vigorous leaf and root development; second, to follow that by applying a manure richer in potash and phosphoric acid to further encourage fruit production, and of superior quality, and third, to apply a manure at sufficiently short intervals to insure continuous growth and minimize the effect of drought on yield and quality of the nut.

No tree responded more to proper manuring than the coconut palm, especially in its younger stages, and even palms of seventy to eighty years of age responded, as was shown by experiments at Peradeniya. He referred to experiments which had been conducted regarding several points by Mr. Vanderstaraaten, of Negombo, Mr. A. E. Rajapakse (whose experiments we refer to in our book "Coconuts, the Consols of the East"), and others,

and said much had been learnt from them. The thanks of all coconut planters were due to those gentlemen who had allowed the results of their experiments to be published for the benefit of the community. The L.C.P.A. could greatly assist its members if similar data of the practical experiences of coconut planters were collected and the results condensed for publication in their annual report. He was sure the Agricultural Department would gladly assist in making the deductions.

He concluded by remarking that he had not gone into the various mixtures suitable for manures, as so much depended on the soil, local climatic conditions and the condition of the palms when manuring was to be undertaken. Manuring might not always be necessary, and in some cases would be distinctly wasteful unless efficiently directed and cultivation of the soil effected prior to the applications. Needless to say Mr. Bamber was accorded a hearty vote of thanks for his excellent paper, and we are certain that all our coconut friends and readers will be glad to take note of what he has to say.

Tobacco Planting.*

PART VIII.

AT this stage of the proceedings it might be as well to report an interesting interview we had with Professor Paul Karutz, of Cuba, but now on a visit to London, regarding the transplanting of tobacco. "The first thing I set out to avoid," the Professor told us, "is the temporary fading of the plants, which at present is only too apparent as a rule with freshly set-out plants; this I believe could be avoided by using a mixture of tobacco dust and water, as is done on well-managed estates in the United States of America. There the roots of each seedling are dipped into a mixture of tobacco dust and water. This mixture resembles mud, adheres closely to roots, and contains sufficient moisture to prevent them getting dry before they recover themselves sufficiently to draw up the moisture from the ground. This is the case even when the plants are left lying about (which, by the way, should not be allowed) waiting for the tobacco planting labourer to "pop them in." Instead, therefore, of the seedling carrier simply using his hands or arms to hold the young plants, he should use an oblong-shaped bucket half filled with the mixture in which the plants have been placed; the same man could carry a supply and plant them as he goes in holes made by himself or another man on ahead. Relays of buckets with plants could be brought up from the nurseries and the "empties" taken back to be refilled. By such means time and labour are economized, and the plant remains fresh right through and picks up much quicker than by

the usual drop-as-you-go method. Again, it is recognized on all sides that tobacco dust is of considerable value as an insecticide and fungicide as well as a fertilizer when applied to the ground. If there are grubs or other undesirable pests in the soil, including fungus trouble, the tobacco dust goes a long way to counteract the evil. That does not mean to say that other remedies are not as good or even better, but that none of them costs the tobacco planter so little either to obtain or to apply. One might well say that its application is all part of the day's work.

In Cuba and other centres where cigars, cigarettes and tobacco are manufactured the dust is obtained from the sweepings, but it can also be obtained on producing estates by pounding up refuse or inferior leaves, or even by crushing the tobacco stems into a coarse powder. When mixing the dust with water do not use more of the latter than is necessary to turn the dust into mud, for if too watery it does not adhere to the plants.

In order to increase the fertilizing value of the dust, a small amount of pulverized lime, lime stone, or of any fertilizer can be incorporated in the mixture. The addition of lime is often found to be a great advantage. If the application of manure to the seed-beds or the seedlings, or by keeping the roots moist at the time of planting out, can hasten the growth of the seedlings it would often be an important advantage, even to the extent of enabling an improved or exotic variety to be introduced and cultivated, the success of which would otherwise be either uncertain or impossible. India, for instance, is making strenuous efforts to improve the quality of its tobacco (as it is of its sugar-cane, cotton, &c.), but the introduction of all the American varieties tried at Pusa met with a rebuff owing to the slow growth of the seedlings. Although sown at the same time as the indigenous varieties, transplanting could only be carried out a fortnight or ten days later in the case of the American kinds,† and there was a corresponding lag all through the growth period. This is a very great disadvantage in Behar, where one of the secrets of success in tobacco-growing lies in the maximum utilization of the growth period from October to mid-December. During this period the temperature is still high enough for rapid growth to take place and the soil still contains plenty of moisture. A crop which through lack of food materials or through the lateness of the variety makes little growth during October and November remains more or less stationary during December and January and begins to grow again as the temperature rises in February, and such plants seldom attain any great size, and very frequently do not ripen evenly. The difficulty in curing the product during the period of the hot west winds is an additional disadvantage. This, of course, refers only to one district in India, but the lesson to be learned can apply to other centres as well.

Great care is necessary when prescribing a formula for manuring seed beds and seedlings. Some authorities recommend importing concentrated manures to save freight and reducing them on receipt; others urge planters to order the manures ready for use as they are then better mixed and more reliable; which is right, circumstances and experimental trials can alone show.

(To be continued.)

* The *Journal d'Agriculture Tropicale*, in their issue, No. 156, for June 30th, has an important article by M. A. Meunissier "À propos de la Selection des Tabacs," in which the following authorities are cited: H. K. Hayes: "Variation in Tobacco," *Journal of Heredity*, January, 1914, p. 40; E. M. East and H. K. Hayes: "A Genetic Analysis of the Changes produced by Selection in Experiment with Tobacco," *American Naturalist*, 1914, p. 5; A. D. Shamel: "Tobacco Breeding," *American Breeders' Report*, vol. vi, 1910, p. 268; H. Hasselbring: "Types of Cuban Tobacco," *Botanical Gazette*, 1912, p. 113. Want of space, however, prevents us from doing more than mentioning the article and the authorities quoted.

† See the *Indian Trade Journal*, April 16th, p. 91.

Tropical Agricultural Congress News.

THE REPORT OF THE PROCEEDINGS MAY BE PUBLISHED
IN NOVEMBER.

As a large number of our readers and others who are interested in tropical manuring, especially the manuring of rubber, have asked us when our paper on the subject is likely to be published, we communicated with Mr. Staines Manders, who tells us that he is making every endeavour to issue the report of the proceedings of the Congress in November, and has no doubt but that he will do so, in spite of the upset caused by the war. The book will be known as "The Rubber Industry in 1914," and is described as being papers read, with discussions thereon, at the Fourth International Rubber Congress, London, edited by Dr. Joseph Torrey and Mr. Staines Manders. About 600 pp., cloth bound, price 15s. 6d., postage 1s. 6d. extra. Those therefore wishing to secure copies should communicate with us at once, with remittance, so as to ensure a copy being sent to them with the least possible delay. We would also remind readers that we can supply copies of the 1,000-page guide of the exhibition (see our notice regarding same in the last issue, pp. 143-144) for 6s. 6d. post free, cash with order.

Regarding the proceedings of the Third International Congress of Tropical Agriculture held at the Imperial Institute in June, we learn from the Honorary Organizing Secretaries that the report is already in the press, and it is hoped to issue it some time next month (October). This volume will contain the abstracts (with English translations where necessary) of all the papers contributed to the Congress, and a full report of the discussions which took place. Copies will be posted to members of the Congress as soon as they are available; how non-members are to secure copies has yet to be ascertained, but we take it that they will be able to buy them, and the cost will be published when the first book is issued next month.

Later we believe the *Transactions* of the Congress, i.e., the full papers and discussions, will be published, but until the papers can be obtained from the Continent no date can be given as to its appearance. Under these circumstances it is extremely fortunate that the Hon. Secretaries have been able to secure the abstracts and the discussions, for they will prove most useful until the war is over and we can get the complete papers.

Replying to several inquiries as to whether the Batavian Rubber Exhibition and Congress has been postponed *sine die*, we have been obliged to own that we can obtain no official information on the subject, but the Ceylon mail just in tells us that Dr. Lieftinck, Secretary-General to the General Committee, telegraphed to Mr. Kelway Bamber in that island, saying that the exhibition has been postponed. "No date is given when it will be held," continues our Ceylon contemporary; "that, doubtless, will depend upon the course of the war and when it terminates." Unless the unforeseen occurs, we feel sure that every effort will be made to hold both the Exhibition and Congress in about a year's time, and trust that all those who would have taken part in it this year will be able to do so in 1915. Meanwhile, we have forwarded our paper for the Congress on "Farming with Dynamite"

(previous to cultivating and manuring the soil), and have no doubt that when acknowledged we shall then have some more definite news to lay before our readers than we can to-day. All we are able to now say definitely is, that both the Exhibition and Congress have been postponed until after the New Year, and those who have already sent on their exhibits, &c., must wait until they hear from the exhibition authorities regarding their disposal until the exhibition is held. Many of the exhibits were, we understand, stopped and brought back, but not all.

As regards the International Dry-Farming Congress at Wichita, U.S.A., the Executive Secretary writes us under date September 5th: "The evening of Wednesday, October 14th, will be foreign night, when Minister W. R. Motherwell, of Regina, will preside, and the speakers will include TROPICAL LIFE, Mr. E. Braga, the Brazilian Ambassador, Mr. Escobar, Mexico, Mr. Romulo Naon, Argentine Minister, Mr. Wm. P. Anderson for Russia, and others."

The Silver Jubilee of the "India-Rubber World."

THE *India-Rubber World*, of New York, promises shortly to publish "The Whole Story of Rubber Machinery" in a book of 40 chapters, 1,000 pages, and 800 illustrations, by its ever-popular editor, Mr. Hy. C. Pearson. Those interested in such a work should send us in their orders at once. Price \$12 (50s.), postage extra.

This reminds us. Congratulations are due to our New York contemporary on attaining its twenty-fifth year of publication, for the September issue just to hand marks its Silver Jubilee. We are sure every one of our readers on remembering this is shaking hands in his mind with Mr. Pearson and Mr. Pfaff, and asking them to congratulate the rest of the staff on the journal, which we should all miss so badly were it to cease publication. The first time we ever heard of the *India-Rubber World* was at the beginning of 1895, when the paper could only have been six years old. We went with a friend to ask a well-known seller of rubber seeds which paper gave the best all-round rubber news and discussed several without our friend feeling that they were likely to be of much use. "Umph!" he said, "they do not sound of much use, but say, what about that American paper, the—the *India-Rubber World*? that ought to help me, I should imagine." "Not a bit," snapped the seller of seeds. "Why, that's only about rubber shoes and bottles, babies' comforters and children's rubber; that won't suit you at all." Then we left, and were hardly outside before our friend stopped and said, "Say, where can we get a glance at the *India-Rubber World*? I have never seen the paper, but am reckoning that that fellow does not want us to see it, so I should like to see it all the more, but where can we go?" We suggested the Patent Office library, and, sure enough, well within half an hour we were poring over the desired details almost as though they had been written for us, and the friend went off delighted, whilst we remained to enjoy further study, and have never lost sight of the paper since.

Copra Spoilage on a large scale and its effect on a Bronze Propeller Shaft.*

By DAVID S. PRATT, Ph.D.

THE Swedish freight steamship *Nippon*, with a large cargo, composed chiefly of dried coco-nut meat, or copra, was driven upon Scarborough Reef during a severe typhoon in May, 1913. The reef lies off the west coast of Luzon, and is practically submerged even during periods of low tide. The unfortunate vessel was firmly held by the coral, and the copra in the various holds was thus alternately submerged and exposed to a greater or less extent by the fluctuations of the tides.

The conditions thus presented unique opportunities to study the spoilage of copra on a very large scale. The salvage crew boarded the *Nippon* several days after the disaster, and found the hatches tightly closed. It was necessary to lighten the vessel before attempting to drag it into deep water. During an attempt to investigate the holds preparatory to discharging the copra, one member of the crew was fatally overcome by noxious gases and several others were rescued with difficulty. This dangerous condition persisted even after the holds had been open several days, and greatly interfered with the work of salvage. Everyone who stayed below for a short time was affected with giddiness and marked palpitation of the heart, followed by unconsciousness unless immediate relief was sought in the open air. The eyes became seriously inflamed, and contact with water in the holds resulted in burns and sores.

The condition appeared so remarkable that an investigation by the Bureau of Science to explain the causes of the trouble was decided upon, and I was detailed to undertake the work. It was desirable to ascertain the nature of the poisonous gas and the caustic products present in the bilge water, not only in their bearing on the health of the workmen employed on the *Nippon*, but also as throwing light on the very important problem of copra deterioration.

Pumps had been installed on the *Nippon* before this investigation was started, and were regularly operated during the day. The sea water that penetrated during the night through the various leaks was thus partially removed. In spite of the daily circulation established, it was possible to obtain samples of bilge water containing sufficient decomposition products for partial

identification. It was found that bacterial action was taking place throughout the mass of copra, with the production of a large amount of hydrogen sulphide. Distinct tests for this gas were obtained in the open air at a distance of about 150 metres from the scene of the wreck, and vessels stationed near to render assistance were completely blackened within a short time. The hydrogen sulphide-producing organism was found to be a motile rod. It appeared to act on the cellular tissue and cause an extraordinary selective destruction of the copra. One of the crew volunteered to obtain a sample of bilge water early in the morning before pumping was started. Accordingly, I left a bottle with him the preceding evening, with directions to fill it and immediately wire on the rubber stopper. This sample was carried to Manila for experimental purposes, and opened some days later in the laboratory. It consisted entirely of coco-nut oil, of slightly dark colour and disagreeable odour. No water was gathered with the oil, indicating that the amount of free oil in the hold at that time must have been considerable, but owing to the

darkness its presence had not been noted. Unfortunately, the sample bottle was made of opaque blue glass, with the result that I had no intimation of its true contents until after my return to Manila. Moreover, the floating debris of discharged copra had already rendered the adjacent surface of the ocean oily and effectively masked the effect of free oil which must have been pumped out early in the morning. The bacterial action had broken down the

cellular tissue of the copra and liberated the oil. This oil contained 60 per cent. of free oleic acid.

The water passing through the copra was decidedly acid, a specimen taken late in the afternoon containing 0.5 per cent. calculated as sulphuric acid. The acidity must have been much greater before the pumps were installed, and accounted for the caustic action of the water. Sulphurous and sulphuric acids were identified in the water, accompanied by various organic acids with indol and skatol resulting from decomposition. The action of this poisonous water was very severe, causing intense smarting where it came in contact with the skin, accompanied by very pronounced swelling of the testicles. These evil effects were mitigated by frequent bathing in salt water, and a shower was maintained on the deck for this purpose. This acid water was being pumped continually into the open sea, and the decaying copra was discharged as rapidly as possible. The relatively large amount of free acidity thus produced may be judged from its effect on a bronze propeller shaft used on one of the ship's small launches. The

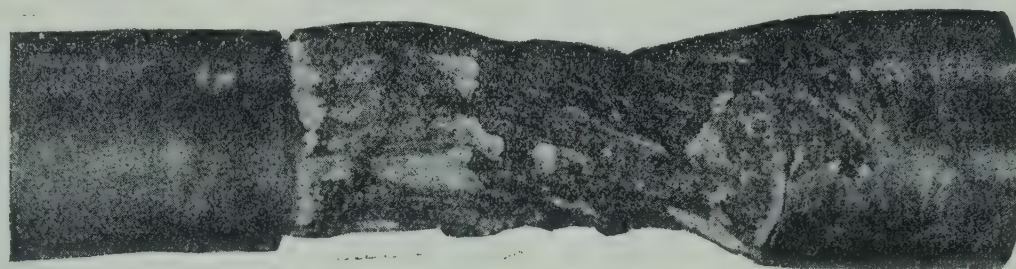


FIG. 1.—Bronze propeller shaft, showing corrosive action of acid from decaying copra.

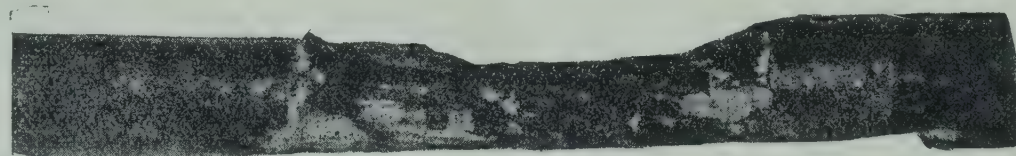


FIG. 2.—Side view of cross-section of the shaft shown in fig. 1. (The ends were protected by the bearing and propeller, respectively.)

Photographs by Cortes.

* Reprinted from the *Philippine Journal of Science* of December, 1913, but which we only received in June, 1914.

portion exposed to the water was reduced to about one-half its original diameter. It should be remembered that this was corroded, not in a protected bay or harbour, but in the open sea.

It is very probable that the many instances of deterioration known to take place during the shipment of copra are repetitions of the above conditions on a small scale. Sea captains have frequently informed me that it was always considered unwise to remain long in holds filled with copra. This finds its explanation in the slow production of toxic hydrogen sulphide. The rate of bacterial action depends upon the care used in preparing the copra and the degree of moisture present. With carefully dried copra, the deterioration due to hydrogen sulphide-producing and other organisms will be at a minimum, although it is doubtful if it can be entirely avoided until more satisfactory and sterilizing methods of preparation are generally employed.

When Crystallized Cane Sugar is at 25s. to 28s. cwt. or more.

WITH sugar again at the "good old prices" that made those of our grandfathers' generation who owned estates reckoned to be rich men simply because they were sugar planters, it is interesting to note the last two books* that have come to hand treating with the preparation of sugar, if not its actual production, on which, however, the publishers of the two works we are about to review have also issued several well-known books by leading experts.†

Taking the book on filtration first, this deals not only with sugar on the estate factory in the Tropics, and the refinery in Europe, America or elsewhere, but also with the filtration, *i.e.*, the separation or isolation of solids from liquids in factories treating foodstuffs, dyes, paper-pulp, ores, clays, paint, wax, waste waters, &c., the list of patents granted in the United Kingdom relating to filters and filter presses, included at the end of the book, being something that is wonderful to behold. In the first portion of the book Mr. Bühler describes the various types of filters and the best method of arranging them to minimize labour and space, whilst in Part III. (p. 104 *et seq.*) Mr. Eastick considers the theory of filtration and

describes the preparation of the solutions for filtration, &c., and has selected the sugar industry to illustrate the various methods described, because it presents more difficulties than are usually met with in other factories. Dealing with filtering mediums, the details devoted to Kieselguhr (Ger. Kiesel = flint, guhr = a deposit) are particularly interesting, especially as illustrations of the various kinds, Algerian, Australian, and Spanish are included. This infusorial, or more properly speaking, diatomaceous, earth consists of the skeletons of minute water plants called *diatomaceæ*, which are of various shapes and sizes, according to the species to which they belong, and samples from different parts of the world exhibit characteristic differences, as the book shows, when seen under the microscope. These small siliceous organisms are to be found in any pond; and where the conditions are favourable to their growth they multiply rapidly, and on decaying fall to the bottom, forming layers of varying thickness, hence their name in German. Kieselguhr is very light, a cubic foot weighing in some cases as low as 12 lb., against 100 lb. for sand, and is used as an absorbent, especially in the manufacture of dynamite. How this and other filter-mediums are used and recovered are fully explained by Mr. Eastick. We are not filter experts, but we believe that this work will bring those who study it "right up to date" as regards filters, filter-mediums, and filtration.

Regarding Mr. Koppeschaar's book, this has been written to bring the signification and value of the principles of evaporation within the easy reach of a wider circle than at present seem in possession of them, whilst whatever differences do exist in cane and beet sugar evaporation plants, due to the different properties of the juice (cane and beet) to be treated and methods by which they are treated, are pointed out." We attach considerable importance to the work, for even if prices just now are good, they will only remain so long enough, we fear, to enable the planter to make a little profit, besides allowing him, if he is wise, to put his factory in order and bring it up to date. This study, therefore, of the various processes and the factors that influence their economical application can have, and will have, if properly mastered, a very great effect on the final financial results, and that, to our minds, means the final *net profit*, especially in regard to the use—and economizing—of fuel which can run away with so much of the profits if not well understood.

* "Filter and Filter Presses." By F. A. Bühler, with additional matter relating to "The Theory of Filtration and Filtration in Sugar Factories and Refineries," by John Joseph Eastick, F.I.C., A.R.S.M. 184 pp. 327 illustrations. Price 12s. net. Norman Rodger, St. Dunstan's Hill, London, E.C.

"Evaporation in the Cane and Beet Sugar Factory." By Edward Koppeschaar. 116 pp., with many figures and diagrams. Price 7s. 6d. net. Norman Rodger, St. Dunstan's Hill, London, E.C.

† These include the following: By Prinsen Geerligs, "Cane Sugar and its Manufacture," in Dutch, Spanish, or English, 13s. 6d. post free; "The World's Cane Sugar Industry—Past and Present," 13s. 6d. post free; "Methods of Chemical Control in Cane Sugar Factories," 4s. post free; "Two Wall Charts for Sugar Chemists" (on cloth), 5s. 6d. the two post free. By Noel Deerr, "Cane Sugar," 22s. post free. By T. H. P. Heriot, "Science in Sugar Production," 6s. 6d. post free. By Harloff and Schmidt, "Plantation White Sugar Manufacture," 8s. 3d. post free.

In the Press—"Fabricacion de azucar blanco en los Ingenios," price not stated. By Maxwell, "Sulphitation in White Sugar Manufacture," to be 8s. 3d. post free.

WHILST the war tended to discourage orders for a day or two, we are glad to see that in Ceylon at any rate the agricultural authorities are urging cultivators there to popularize the use of the harrow for soil mulching in the drier districts, and demonstrations carried out with a rectangular harrow drawn by a pair of ordinary bullocks to show the results on the surface of the soil were most satisfactory, the coconuts on the harrowed part standing the drought much better than elsewhere. Of the new types of ploughs the lighter makes of the "Meston" type still seem more popular than is desirable, as the heavier types are doing good work at the Government experimental stations; these, however, cost more to work, since they require larger animals to draw them.



Photo by C. Vandyle.]

"Tropical Life Friend—No. 111.

E. H. CUNNINGHAM CRAIG, B.A., F.G.S.

OIL, i.e., petroleum oil—like rubber a few years ago, and vegetable oils, according to many people, in the days to come—has certainly occupied a "star" position in the world, if "all the world's a stage," and this being so, no one has played so leading a part in supporting that "star" as "Our Friend" this month. Many people have played up to her, wooed and won her, wheedled money out of the public by means of her attractions, real and artificial, but no one has done more to enable petroleum oil to gain its real place among the industries of the world than Mr. Cunningham Craig. No matter where oil has been found, or even reported to exist, there "Our Friend" tried to prove the truth of the report and the extent of the fields. The recent discussion in the English House of Commons over the vote asked for to finance the Anglo-Persian oil scheme called forth a debate in which oil interests at other centres were discussed, and showed generally what important concerns were trying to grip the chief producing districts and keep competitors outside. Whatever aspect the controversy may assume, or whichever side or sides may win, those who have "followed oil" during the past six or seven years know what a leading, if unassuming part Mr. Craig has occupied throughout that period. When the history of the All-British Oil Industry is written "Our Friend's" name and the results of his investigations will certainly be "right there" in the front.

Lost in the intricacies of the struggles now going on between rival vegetable oils, coco-nut, palm, soya, &c., we have not, we are afraid, been following mineral oils

as closely as we should, although "in spite of all temptations" to do otherwise we have never ceased to take a keen interest in the progress made by the various Trinidad (B.W.I.) oil companies, which owe so much to Mr. Randolph Rust, who spent much time and money in placing the oil industry of that Island in the lofty niche it deservedly occupies to-day, although we fear that in doing so others have reaped the major benefits whilst Mr. Rust did most of the work.* Trinidad, however, knows Mr. Craig well, for he laboured long and exhaustively to ascertain everything that was worth knowing concerning the prospects for oil in that island.

If we remember rightly, "Our Friend," who was born in 1874, and educated at Trinity College, Glenalmond, and Clare College, Cambridge, was lent to the Trinidad Government in 1903 as Geologist, and under that official designation started his investigations, and in the four years that followed, what he did not learn about oil in that Island was not worth troubling about, as those who attended his lecture in London in 1906 on the subject, can testify. Mr. Craig also surveyed, geologically, the Island of Barbados for the Government.

In 1907, "Our Friend" left Trinidad and retired from the service of the Government soon after. Since then we have not followed his career and his wanderings very closely, but remember him as conducting geological investigations in Burmah, Persia, India, Beluchistan, South America, South Africa, Canada, and we believe he has again visited the West Indies. In South Africa he made a careful geological examination of the territory covered by the Union of South Africa for the Government out there.

Those who want to consult Mr. Craig in print will be interested in his book on "Oil Finding," which, in face of the wanderings of its author, is certain to prove exhaustive in the information with which it deals.

"Our Friend" has not severed his connection altogether with the West Indies, being consulting expert to the boards of several oil companies in Trinidad, as well as to similar concerns elsewhere, the Burmah Oil Co., the Anglo-Persian Oil Co., the British Alberta Oil Co., &c. Being one of the founders of the Institution of Petroleum Technologists, Mr. Craig, who is a member of its Council, takes a keen interest in the work it is doing in the interest of the mineral oil industry.

SINCE it has had temporarily to suspend publication, we beg to do for our old friend and contemporary what it cannot do for itself, viz., to state that owing to the war *Le Journal d'Agriculture Tropicale* of Paris will not be published for some months to come. We give this information without being asked to do so, but knowing the extensive circulation our French rival has enjoyed for many years, we feel that those interested in the paper will be glad to have definite news concerning its appearance. Regarding those responsible for its contents we are less certain, but understand that M. Main is now being utilized by the French Government as an officer-interpreter, as is also the son of M. Anthime Alleaume, the cacao broker of Havre. Dr. (now Lieutenant) Gatin is, unfortunately, wounded, and M. Chevalier is a "territorial," whatever that signifies.

* See TROPICAL LIFE for May, 1906, in which we give full details up to that date, accompanied with several illustrations of the pioneer work Mr. Rust was then engaged in in Trinidad.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

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5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

SEPTEMBER, 1914.

The Trade War with Germany.

IF I WERE CHANCELLOR OF THE EXCHEQUER.

BY THE EDITOR.

REFERRING to the first article in the August issue on "Why and How the War will Benefit the Trade of the Empire," as the newspapers have said, the question of finance must not be overlooked. This, of course, is what we have contended and striven to drive home to those in authority over us in every way we can, viz., that, in future, the leadership of the world lies with the nation who owns the heaviest purse,* and so it behoves us to develop our possessions and spheres of influence in every way possible. We are glad to see that the present Chancellor of the Exchequer shares our opinions, for, according to the *London Daily Telegraph*, in replying to a deputation, he referred to the important part which finance would play in the war in these words:—

"In my judgment the last few hundred millions may win this war. The first hundred millions our enemies can stand just as well as we can; but the last they cannot, thank God, and therefore I think cash is going to count much more than we can possibly imagine at the present moment. We are only at the beginning now. Of course, if we have great victories and smashing victories that is all right, but then they may not come yet. We may have fluctuations, and things may last long.

"We are fighting a very tough enemy, who is very well prepared for the fight, and he will probably fight

to the very end before he will accept the only conditions upon which we can possibly make peace, if we are wise.

"We financed Europe in the greatest war we ever fought, and that is what won. Of course, British tenacity and British courage always come in, and they always will; but let us remember that British cash told, too. When the others were absolutely exhausted we were getting our second breath, and our third and our fourth, and we shall have to spend our last before we are beaten."

In order, however, to obtain these millions to spend in the art of war, some one, and many a one, has to make them in the arts of peace, and that takes us back to the question of the trade war, to carry on which the manufacturers and merchants of the Empire are being trained and mobilized. This war also needs financing, although, thank goodness, only in pence or even farthings compared to the millions that will go into the melting-pot before peace is proclaimed.

For this reason, if I were the Chancellor of the Exchequer, I would arrange through the Board of Trade and the leading mercantile houses to consolidate the Empire's commercial interests in some such way as the following, so as to enable the rank and file of young Englishmen who have hitherto been discouraged from carrying on a trade war overseas, to do so now with as great a vigour and with the same chances of success as is likely to be ours in connection with the other war on the Continent.

In the same way as Lord Kitchener asked for 100,000 and then 500,000 men to fight our enemies with sword and bayonet, the Board of Trade should appeal for suitable men to go and push our trade and interests in all parts of the world overseas, both near the coast and up-country. The question of language need deter no one; it can be picked up by anyone who means to get on whilst he is learning the general business routine. I say this as no war can be carried on without soldiers of all ranks, and our trade soldiers are at present lacking for want of leaders and absence of prospects, for at present those who make the start must, more or less, compete against existing British interests, and these, instead of collaborating with the newcomers, will fight them, not join forces with them to fight the common enemy. We want to change all that. The Board of Trade should appoint a General and the Staff necessary to finance and guide this new army, and render them independent of the old guard and their old-fashioned ideas, and then we should soon see the rank and file flow in to help. The fall in the price of rubber in the Tropics has cut many men adrift, experienced ones as well as just "creepers"; these should at once be eligible. Again, when the war is over thousands of young men will be only too glad to enter any channel of trade, and many of these would also be very suitable for training as traders overseas.

The first thing to do, however, is to finance these soldiers. Nothing can be done without money, cash or credit, and, unlike our competitors, this has been lacking to the English trade-adventurer, and until it is forthcoming nothing can be done, for the making of machinery and other goods is easy enough; it is the selling of them at a profit and to get in the money that is so difficult, and yet those who do the first get

*As those seeking to float war loans, either at home or abroad, very soon discover.

financial assistance far more easily than even the big trader. There are, however, many thousands of the smaller manufacturers in London and elsewhere who could increase England's trade to an unprecedented extent if a little help along the lines indicated was forthcoming. The big, old-established houses may object to this competition, but it would be a mistake to do so; properly managed, if they helped form the banks it would increase their revenues and diminish their risks. Besides, for the good of the country and of those who have turned out to fight, the interests of the few whose trade is being protected without their having to go out to fight must not be considered when the advantage of the many is at stake, and it is undoubtedly better for a country to have a large number of smaller merchants and traders than a few very large ones.

Having discussed the fighters, we then come to the sinews of war, cash and credit, especially the latter, for very little cash is needed; it is mainly a matter of banking facilities. We want at least two big banks to which present banks, financiers, merchants, and the Government would subscribe, or otherwise arrange to run on a co-operative basis. Then we want a big discount bank to handle the bills, managed by men capable of advising and guiding merchants, manufacturers, and traders when all goes well, or to liquidate failures, thereby preventing unnecessary losses when mishaps occur. All these banks must be quite independent of each other in every way, so that if one gets into difficulties the credit of the others need not necessarily be affected. On the other hand, they must work in perfect unison, and, for the sake of brevity, I will call them "the machine." Besides these we shall need smaller banks, *not* branches but independent concerns, in the large towns and manufacturing centres, and at the chief trade centres abroad, independent of, but financed and guided from headquarters. If we already have banks there, they can be incorporated or arrangements made to finance traders through them.

Having thus secured financial facilities we come to the trading. A merchant in England sends out six young fellows to push on our trade (and their trade) abroad, or those on the other side want to make a start. At first everything is tentative until the new soldier has had some training, gained nerve, become acquainted with local habits, tastes and patter, and generally "feels his feet"; then he spreads out, and sells, barter, and trades on his own responsibility, but financed by those behind him until, of course, he is quite independent. Meanwhile, the orders, and produce or cash, begin to come in and are sent home. Each unit throughout, except actual branches of a firm, must be absolutely independent of each other so far as book-keeping goes, so that in case of a failure through inexperience, illness, or *force majeure* the others would not be compromised beyond the unit's debt. Should a failure occur, then the local merchant, or the big firm at home, or even, in the case of a serious "smash," the machine itself steps in and works to minimize the loss. One unit is simply replaced by another, or if the business is to be transferred this is effected, book debts, goodwill, stock, &c., without having to accept a ruinously nominal price as

must be done at present. Some losses are certain to occur, but the profits on the many mount up whilst the losses are minimized, and since each unit is entirely "on his own," to sink or swim according to his ability and fate's decree, and is *not* a paid servant, each one naturally strives his best to keep going, and so the whole machine is run by picked men, without favour, and goes strong. Brains and energy help capital and experience; sometimes you tell the man or men to go ahead, and indemnify them against loss when you wish to secure a new centre; elsewhere, those at home or at the shipping port may warn the up-country man to "pull-in" for reasons that are not apparent where he is. To the steady and gifted man promotion is sure and often rapid. No posts must be given by favour, and so the way is open for those at the extreme outposts to be drawn homewards and, with their long practical experience, to gain control of affairs, provided, that is, they have saved their money and gained the confidence of the majority. One point more regarding the manufacturers, and especially the smaller men, to whom progress is denied at present owing to the absence of financial assistance. Here the banking machine could assist to consolidate and facilitate the co-operation of mutual interests as follows: Modern factories to-day, as a rule, are strong believers in division of labour, and instead of making everything themselves they buy the parts from various firms, and put them together with such additions as their own workshops turn out. With the banking machine behind him, even a small manufacturer could execute an order which at the present time he has to pass by, and so we are told there are thousands of pushing firms in London alone who could make great use of the financial assistance which others ought to be equally anxious to offer them. With "the machine" a manufacturer called A. obtains an order, say, for a mill that costs £500 or £1,000, of which he actually makes only 25 per cent. He should be able to go to his bank and, once they approve of the firm giving the order, they assist the man to complete the work—that is, they send him to other customers to secure the parts, and they are paid through the bank by having their accounts credited with the amounts due. Except for wages no money is needed, and when the machine has been delivered and paid for, probably A.'s account will be credited in the same way, and by then he is busily engaged in doing work for orders obtained by B. C. and D. on the same terms. So it should be; the organized utilization of the energy and enterprise of the, at present, unattached unit, in other words, the consolidation of the nation's commercial interests to enable all, millionaire and hundred-pounder alike, to do their share in pushing the trade of the Empire abroad, and increasing the demand for labour at home.

But at present "the machine"—that is, the organization and co-operation of the various units—is altogether missing. I hope the present crisis will bring us all together and help to establish it not only for the good of the individual, but also to enable the Empire as a whole to obtain those "last few hundred millions" which this Journal, and now our Chancellor of the Exchequer, recognizes as being the one thing necessary to always place us ahead of our competitors and to keep us there,

The Manuring of Rubber.

ELSEWHERE (p. 167) we call attention to the efforts being made by Dr. Torrey and Mr. Manders to ensure the publication in November of the report of the July London Rubber Congress, in which will be included our paper, together with the discussion that followed on "The Manuring of Rubber." In this paper, which is of considerable length, our Editor called attention to the tendency, when the last Congress was held in London in 1911, to plant the trees as close as possible, whereas to-day he says, "Those in whose policy I have most confidence are discussing such distances as 18×24 , 24×24 , and even 30×30 , giving 100, 75, and 48 or 50 trees only to the acre. This indicates that the policy I advocated in 1911 (at the reading of Mr. Lierke's paper) has proved, in the end, likely to give the largest amount of rubber per acre. . . . When setting out to manure your estate, therefore, you must make up your mind what you want. If you wish to develop trees with a large amount of foliage and good thick bark, you will have to modify the formula of your manures to secure the wood and leaf necessary to bring this about.

. . . In stimulating the growth and vigour of the tree, this must, of course, be done with knowledge and care, otherwise you can soon exhaust it or render it too delicate to last. The roots especially should be encouraged to expand and spread downwards as much as possible, since surface feeders suffer from drought. The giant tree at Heneratgoda may, it has been claimed, owe its abundant yield (I think it gave 275 lb. dry rubber in three and a half years) to the depth of its roots, which Mr. Lyne suggests may have tapped a water supply deep down in the soil that other trees could not reach. Again, deep-rooted trees are better able to withstand strong winds, and so prevent the catastrophe that overtook some of Mr. Wickham's trees in Ceylon, when in June, 1913, some thirty or more were blown down, the roots being unable to hold them up against the strong winds then prevailing."

The paper concludes with the following words: "Neither I, nor those who have helped me draw up the long list of formulas mentioned above, wish to infer that they are perfect, above all that they will suit all climates, soils, and conditions . . . no wise planter would, I take it, lay down a large area under manure without first testing it on an acre or so to see exactly what quantity to give each tree. Because the next estate does well with a formula, that does not say yours will; and even on the same estate it may be equally necessary to make a change,

since adjacent soils can and do vary to a remarkable degree."

Had the Batavian Congress taken place, a paper on "The Planning of Manurial Experiments" was to have been read by Mr. W. Barrocliff, of the Federated Malay States Department of Agriculture, and a second one by Dr. A. J. Ultee on "The Manuring of Hevea." We are sorry to feel that we shall not see these papers for a good time yet.

The last issue of *Grenier's Rubber News* also calls attention to the advantage of wider planting, especially in the reduction of costs. As we did not include this point in our paper, we reproduce the following from our contemporary:—

"Although we might now lament the fact that the advantages of wide planting were not realized early enough in the history of the industry, we are glad to see that the advantages of thinning out appear to be receiving daily more attention. If a closely planted

field is left unthinned long enough the yield might suffer in the end, whereas, on the other hand, if thinning out is resorted to, despite a temporary falling off in the latex, the yield per tree will rapidly improve as the number to the acre is reduced, and we have heard of some very marked improvements in trees, from the standpoint of both yield and the renewal of bark, in areas that have been thinned out.

"Regarding its effect on the reduction of costs, it should be obvious that if we can get 300 lb. of rubber from an acre of 100 trees instead of from an acre of 175 trees, the cost of collection will be much cheaper. This

would appear to be one direction in which material reduction in costs might be affected.

"The highest profit per lb. is in future going to be made by those estates that can obtain the most rubber per tree, from the fewest trees with the smallest labour force."

The above, therefore, confirms our advice to plant wide and manure accordingly.

WE are still without regular news of the Cotton Market. Just as we go to press we learn that up at Liverpool lower prices are inducing spinners to purchase supplies available with increased freedom, the great complaint being that only certain grades are being offered. The absence of all kinds is evidently checking the work. Meanwhile we notice that Sir Charles Macara is advocating the establishment of cotton reserves and urges that the present is the time to put such a suggestion into operation.

Where Rubber is Used. No. 5.



No. 5.—Lower deck of the T.S.S. *Wahine*, laid with North British interlocking rubber tiling.

[Month by month we propose to include a photograph similar to the above, illustrative of the more modern uses of rubber, especially on a large scale.]

Tea Notes.

WITH war declared on Tuesday, August 4th, and the banks closed until the 7th idem, the month opened with a feeling of nervousness, and buyers were naturally somewhat shy; but things settled down when once it was recognized that the market was going along on fairly normal lines. Considering the magnitude of the crisis, the market stood the strain remarkably well, and, beyond rather marked irregularities in prices, no violent change occurred. Thin teas were difficult to place, no matter how good-looking, but finest kinds were inquired for at the end of the month, and the tippy Assams realized high prices.

The export trade was, for a week or so, absolutely at a standstill owing to the embargo placed on the exportation of tea by the Government. Representations were, however, made by the Indian, Ceylon, and Tea Buyers' Associations to the Board of Trade, pointing out (1) that there was three months' supply in the country; (2) that large consignments were on the water; (3) that the Indian crop was coming forward, and that exports would be at their highest during the next four or five months; and (4) that the Calcutta and Colombo markets were closed; therefore, if re-exports were prohibited for any length of time, there was bound to be a glut of tea, with a consequent loss to tea proprietors in India and Ceylon. It was also pointed out that the prohibition of exports to the United States and Canada would result in American and Canadian merchants reverting to teas other than British-grown, thereby entailing a very serious loss to the interests of British-grown teas. As a result of the representations made to the Government, the prohibition was removed on August 20th, but as a natural sequence to the embargo the exports for the month were lower by $1\frac{3}{4}$ million lb.

Sales during September, report Messrs. W. J. and H. Thompson, averaged $9\frac{1}{2}$ d. per lb. for Indian during the week ending September 3rd, against $10\frac{1}{2}$ d. last year, and $8\frac{3}{4}$ d. for Ceylons, against 9d. in 1913. At these sales the strongest demand seems to have been centred on teas up to about 9d. per lb., but during the next week, while good qualities maintained their level owing to the steady inquiry, common and plain tea up to $8\frac{1}{4}$ d. per lb. went back. The average for the whole sale (to September 10th) of Indian tea accordingly only worked out at $9\frac{1}{4}$ d. per lb., against $9\frac{7}{8}$ d. per lb. a year ago, whilst Ceylon (of which the finest sold well) realized $8\frac{3}{4}$ d., against 9d. a year ago. Coming to September 17th, Indians averaged $8\frac{3}{4}$ d. per lb., against $9\frac{3}{4}$ d., and Ceylons $8\frac{1}{2}$ d., as compared with 9d. in 1913.

WE see by the *Indian Planters' Gazette* that the Committee of the Calcutta branch of the Indian Tea Association decided to ask Messrs. T. A. Taylor and Co., Madras, who are agents for the "Deming Aerospra" spraying machine, to forward one of these useful machines to the Tocklai Experimental Station for experimental purposes. The Committee, on being advised that an improved sample would be forthcoming shortly, which would be forwarded to Tocklai if desired, the Secretary was instructed to accept same, and were awaiting delivery, when the mail left, to experiment with same.

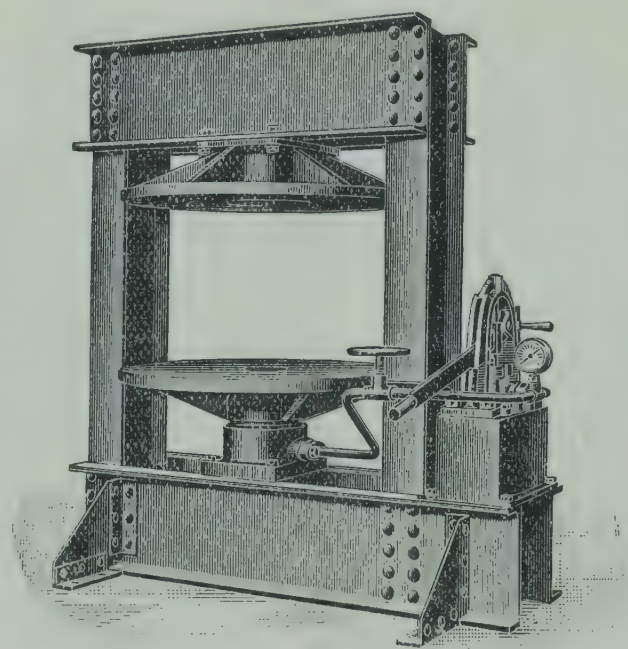
THE September issue of *United Empire*, published as a War Number, is an excellent one, full of valuable and interesting information, written, too, with the

utmost fairness to those dealt with in the articles. These show that, much as we all blame Germany for the inhuman manner in which she has carried on this war, every consideration has been accorded her in her efforts to plant out her surplus population in her own colonies and to extend her sphere of influence, as other countries have always done. The first article on "How the War Began" being Part 1 of "The Empire and the War" will be welcomed by all, for these hustling times soon cloud our brains as to what passed a month, or even a week, back. Then follow such articles as "Slav v. Teuton," "The Achilles Heel of Germany," "German Colonizing," "The German Colony in China" (in view of the Japanese attack this is certain of attention), "The French Colonial Empire." Briefly put, the articles confirm our own opinion of Germany's mull, viz., the days of mediæval brute force to attain one's end is long

past; it was even out of date in '70-72, and had Germany's methods of diplomacy and culture (spelt with a "c," not a "k") been otherwise than those adopted by some of her leading men, she would have done herself as a nation much more good than all her victories could ever bring her; but then, unfortunately, those who caused her wars thought more perhaps of their own interests than of that of the people as a whole; hence her downfall in the opinion of the civilized world, and her failure to win in her struggle with France and Russia.

THERE was a fair turnover in American cotton at late rates. Middling is quoted (September 18th) at 5·80d. Brazilian and East Indian remain unchanged. Egyptian had a moderate sale at steady rates. Yesterday 800 bales of American, January-February, at 5·50d. were allotted. Crop accounts are favourable, and picking is becoming general in many sections.

For the War Office. No. 1.



The above illustrates a hydraulic press, specially designed for and supplied to the War Office by Messrs. Hollings and Guest, Ltd., of Birmingham, for taking the solid tyres off motor wheels. It has been designed to be light and strong, and to take up as little room as possible. Practically all of best cast steel, it is extremely neat in appearance, its total height being under 6ft. 6in., and width under 5ft. 8in.

"Tropical Life" at the Play.

A GOOD TRIO OF PLAYS.

WANTING a little recreation and diversion to our minds after the upset following the outbreak of war, we went to see Mr. James Welch in "When Knights were Bold," at the Prince of Wales' Theatre, and on another occasion Mr. Cyril Maude in "Grumpy," at the New Theatre, in order to enjoy a good laugh, with which to sustain ourselves for a little time to come. "Mr. James Welch would make the Sphinx laugh if it came to life," one victim exclaimed, and we agreed with him, whilst *à propos* of "Grumpy," we heard the following yarn concerning a certain personage on the Continent who was reported to have retired from Nancy to Metz. The management at the New Theatre provides postcards, already stamped, with pencil attached, on which to send a message to a friend saying what you think of "Grumpy," and one of the cards is said to have gone forth with this verse on it:—

"Oh Villum! Just fancy,
You've bolted from Nancy,
I fear that this war you'll rue,
But if you feel humpy and vicious and dumpy,
Scrape up your pfennigs and come and see 'Grumpy,'
It's the very best thing you can do."

We agree with this verdict, for we think Mr. Maude is quite at his best in this character sketch of Andrew Bullivant, the retired lawyer, old, crotchety, scolding and fault finding, but still kind, keen and anxious to help others. With his asthma, his baked apple, his shawl, slippers, and Ruddock his valet, straightening him up to walk up to bed, no one would have thought him capable of outwitting Jarvis, the gentleman thief (Mr. Montagu Love), and getting back the £90,000 diamond he stole, and so enabled Bullivant's nephew (Mr. Combermere) to marry his granddaughter, very attractively played by Miss Elsie Mackay. Susan (Miss Maud Andrew), whose hair, tied round the camellia, gave the clue that drove home the theft to Jarvis, was also a clever actress, whom we hope to meet again. Of Mr. James Welch we had heard so much that we were half afraid he might not have come up to expectations; we can only say that he exceeded them; if you doubt us go and see for yourself.

Miss Lillah McCarthy, as Madame Okraska, in "The Impossible Woman," at the Haymarket Theatre, wears wonderful dresses and plays the piano divinely. She also shakes her ward, Karen Woodruff (Miss Hilda Bayley), which we wanted to do at times ourselves, although for the opposite reason to Madame, as we wanted her to make up her mind to return to her husband (Mr. Godfrey Tearle), as she does in the end, and have no more to do with "The Impossible Woman" in spite of her powers over everyone as a pianist of world-wide repute. "Is he not 'ripping'?" said the fair occupier of the stall in front of us, referring to Mr. Henry Edwards as Franz Lippheim, the Dutch fiddler; we are not sure what the word actually means, but as the tone was decidedly appreciative, so we will agree that Franz was "ripping." The play is founded on "Tante," the novel by Anne Douglas Sedgwick (in private life Mrs. Basil de Selincourt), and Karen, her husband, and Madame, the woman, offer much food for thought. We were glad that we went to see this play, and recommend others to go also,

The London Produce Markets.

FINANCE AND INDUSTRY.

SUMMING up the position for the week ending September 12th, increased ease is reported in the money market, due to the abundance of money and the scarcity of bills, coupled perhaps with the idea that the Bank of England may further reduce the bank rate (now 5 per cent., against $4\frac{1}{2}$ per cent. a year ago), owing to its strengthening position, and if this comes about it would have a good effect upon financial and commercial affairs generally. Owing to the more encouraging war news, the Stock Exchange, although still closed officially, is described as having been "quite cheerful" in spite of dealings in securities still being very restricted.

Coming to the produce markets, business officially is reported to be "more or less suspended," but from our personal observation we feel that business is very much held up, except for sugar. On the other hand, one notes with pleasure that, according to *The Times* of September 12th, there has been far less dislocation of industry than was expected, and that 93 per cent. of the workpeople engaged in production are still wholly or partly employed, and that of the remaining 7 per cent. at least two-thirds have left for military or naval service. This is worth noting, for if factories continue to work they will continue to need raw material, especially as "nearly a thousand factories report pressure of work, which, in 176 cases, is diversion of trade from other countries."

Discussing this diversion of trade from the Continent reminds us that large quantities of materials formerly shipped to Germany from the British colonies have become available for other markets, and that means for our own. This is especially the case with regard to British West African cacao and palm-kernels. Thus in 1912 out of a total of 86,568,481 lb. of cacao exported from the Gold Coast Colony, no less than 29,032,923 lb. went direct to Germany, and of the remainder a considerable proportion no doubt reached that country indirectly.

As regards palm-kernels the case is even worse. In 1912 the exports of these kernels from British Nigeria amounted to 184,625 tons valued at £2,797,411, and of this quantity only 25,491 tons valued at £365,461 were sent to Great Britain, practically the whole of the remainder going to Germany. These palm-kernels are used in Germany for the preparation of palm-kernel oil and palm-kernel oil-cake. The former is largely re-exported to England, either as such or in the form of prepared cooking fats and butter substitutes. The whole of this valuable industry could perfectly well be carried on in this country, and the palm-kernel cake, which is obtained as a by-product, would form here, as it does in Germany, a valuable addition to the cattle-feeds available to the farmer, as also could soya-bean cake. The beans could then be planted extensively in our colonies, but we understand that the cake needs being pushed here as it has been on the Continent, otherwise at present prices the extraction of the oil does not pay crushers.

Manufacturers interested in these or other raw materials produced in the British colonies can see samples and obtain every information regarding them in the exhibition galleries of the Imperial Institute,

South Kensington, S.W., which are open free to the public daily from 10 a.m. to 5 p.m. Written applications for information should be addressed to the Director.

Coffee.

The term and spot markets have both continued closed, although public sales may be held about the time we go to press. Apart from financial reasons for holding these up, the absence of any export demand renders sales useless, and spot business for the home trade is confined to finer lots at more or less retail values. As regards any export, even the London Produce Clearing House can register no sales. The only news one can give as regards value is the notification by this body regarding the decision made on the recommendation of the committee that the liquidation of Santos coffee contracts by brokers shall be allowed to continue by private negotiation within the following range of prices:—

Deferred September, 37s. to 38s.; December, 37s. 6d. to 38s. 6d.; March, 38s. 3d. to 39s. 3d.; May, 38s. 9d. to 39s. 9d.

To further assist liquidation latitude is given to those who have contracts open to shift positions, provided the total quantity of engagements is not increased, and that the total Clearing House engagements are lessened thereby. Every transaction to be subject to the approval of the Company.

Regarding coffee futures, in accordance with the above circular a number of contracts have been regulated, comprising Deferred September at 37s. and December 38s., and beyond this we can only repeat that the London spot market has ruled quiet and only limited sales have taken place at prices showing no material change.

According to the new conditions of sales:—

(1) The selling brokers may at their discretion refuse to recognize the bid, or to accept the name of any one desiring to purchase at this sale.

(2) Subject to the previous condition, the highest bidder to be the purchaser, but the vendor reserves the right to bid by himself or his agent, or to alter, vary, or withdraw any lot or lots before or during the sale. If any dispute arise, it is to be decided by a show of hands, or to be left to the decision of the selling brokers.

(3) Brokers or agents purchasing at this sale must declare their principals (to be approved by the selling brokers) immediately after the sale, or be held responsible for the fulfilment of the contract.

(4) Prompt as printed; payment for the coffee to be made as follows: A deposit to be paid to the selling broker on the Monday following the day of sale. The deposit to be 10 per cent. on the selling price of coffee, the same to be reckoned in even poundage; and the balance by cash on the prompt day or on delivery of the warrants; interest at the rate of 5 per cent. per annum being allowed on all payments made before the prompt for the unexpired term.

(5) For all coffees (excepting those sold on quay terms), warrants and weight notes to be made out in 10 bag lots (or as near as possible), when the lot consists of fifteen bags and over; one warrant to suffice for any quantity under fifteen bags.

(6) For all coffees sold on quay terms, one warrant and one weight note to be made out for each lot, but no lot to exceed 40 bags.

(7) The goods to be ready for delivery on the morning after the day of sale; the buyer to have the option of cancelling his purchase of any lot or lots for which he cannot obtain the warrants and weight notes on the second morning after the day of sale; an immediate written declaration that the contract is rescinded to be given to the selling brokers.

(8) The goods to be taken at warrant weights, with customary allowances, as they lie in the warehouse (the damaged portion with all faults) where they may be inspected previous to the sale; any objection as to quality or description will not be admitted or entertained unless made within ten days of the day of sale.

(9) In case of loss from fire previous to prompt day, delivery of warrants, or day of payment, whichever may first happen, the contract of such portion of the goods to be void, and the deposit to be returned, plus interest.

(10) Lot money 3d. per weight note £5 or over, with the exception of quay terms, when Lot money shall be 6d. per lot, as heretofore.

(11) In the event of non-fulfilment of any of the conditions, the goods to be re-sold by public or private sale, and the loss (if any) as well as all charges incurred, to be made good by the defaulter.

We give these details in full as, until the old terms come into force again (whenever that will be), the above should be noted.

Regarding London prices, these, according to the *Public Ledger* of September 12th, can be nominally quoted as under:—

Coffee:	1914		1913	
	per cwt.		per cwt.	
Jamaica, coloury ...	80s. 0d.	to 118s. 0d.	75s. 0d.	to 118s. 0d.
greenish ...	68s. 0d.	„ 76s. 0d.	66s. 0d.	„ 76s. 0d.
good to fine ord. ...	54s. 0d.	„ 62s. 0d.	58s. 0d.	„ 60s. 0d.
East India, superior ...	90s. 0d.	„ 99s. 0d.	86s. 0d.	„ 100s. 0d.
good to fine ...	80s. 0d.	„ 88s. 0d.	80s. 0d.	„ 84s. 0d.
mid. to good mid. ...	72s. 0d.	„ 79s. 0d.	74s. 0d.	„ 78s. 0d.
fine ord. to low mid. ...	61s. 0d.	„ 70s. 0d.	65s. 0d.	„ 73s. 0d.
Mocha, long berry ...	83s. 6d.	„ 85s. 0d.	71s. 0d.	„ 77s. 0d.
short berry ...	90s. 0d.	„ 102s. 6d.	75s. 0d.	„ 92s. 6d.
Nyassaland, low mid.				
to good mid. ...	69s. 0d.	„ 73s. 0d.	65s. 0d.	„ 70s. 0d.
bold ...	75s. 6d.	„ 78s. 6d.	74s. 0d.	„ 76s. 0d.
Costa Rica, good to fine	80s. 0d.	„ 93s. 0d.	80s. 0d.	„ 88s. 0d.
middling ...	75s. 0d.	„ 77s. 0d.	73s. 0d.	„ 76s. 0d.
ord. to low mid. ...	56s. 0d.	„ 73s. 0d.	56s. 0d.	„ 72s. 0d.
Guatemala, foxy ...	54s. 6d.	„ 59s. 0d.	54s. 0d.	„ 59s. 0d.
good ord. to mid. ...	60s. 0d.	„ 72s. 0d.	58s. 0d.	„ 70s. 0d.
good mid. to fine ...	73s. 0d.	„ 83s. 0d.	72s. 0d.	„ 78s. 0d.
Nicaragua, foxy ...	54s. 6d.	„ 59s. 0d.	54s. 0d.	„ 59s. 0d.

How values will pan out finally when the markets open no one can say, whether it is coffee, cotton, cocoa, tea, rubber or anything else. We do maintain, however, that those who are inclined to take a gloomy view of affairs because “tons and tons, shiploads and shiploads of stuff are jammed up” on all sides at producing centres, must also remember that Europe all this time is being “jammed up” with the opposite result, viz., that as soon as the sluice gates of her demand are open (and also remember ocean steamers are not so absorbed in conveying troops from all directions) the rush to be fed, and to replenish “invisible” stocks, truly invisible this time, since they will be non-existent, will

help to sustain values and counteract the trouble now hanging over us through the closing of the markets. Now is the time to give rubber trees a rest; some of them need it badly. Tea planters and shippers are not so favourably placed, but the Russian market, America and Australia are still there. Coffee can keep better than cocoa, which is to our mind the article that requires the most careful handling, as it deteriorates when kept. Taken as a whole, however, unless the unforeseen occurs, it seems likely that the rush to buy when the war is over will greatly help to counteract, at any rate for a time, the slump whilst it lasts.

Rubber.

Coming to this article, Liverpool up to September 4th reported that her Pará market had ruled dull with a slight decline in values, the closing prices being: Hard Fine 2s. 10½d., Soft Fine 2s. 3d., Peruvian Ball 1s. 8d., and Scrappy Negroheads 1s. 8¾d. per lb. Medium Brazilian grades had been quiet, with little or no business passing. The African market had been steady, but the sales have been unimportant, including small lots of Assinee sheets and strings at 2s., Conakry sheets and strings 2s., Elobey Ball 1s. 3d., Niger gutta 9d., and Accra paste 8¾d. per lb. Up to September 11th the market had been more or less idle during the week, and prices have again eased off, the closing values being: Hard Fine 2s. 9d., Soft Fine 2s. 2d., Peruvian Ball 1s. 7½d., and Scrappy Negroheads 1s. 8½d. per lb. Medium Brazilian grades neglected. The African market remained steady, but there has only been a retail business passing, and no particulars are reported.

As regards London, the market after we went to press last month rallied somewhat, and Messrs. S. Figgis and Co. report that a large business was done on the spot in Plantation rubber, closing with sales of Standard Crêpe at 2s. 5d., and smoked ribbed sheets at 2s. 5½d., with September delivery at 2s. 4d., and Hard Fine also dearer; spot value about 3s. 1d., but only small transactions taking place. Soft Fine varied between 2s. 4d. and 2s. 5d., Scrappy Manaos Negroheads at 1s. 9d., and Caucho Ball, upriver, f.a.q., 1s. 9d. The demand for good Eastern Plantation continued with rather higher prices into September, and although supplies arrived freely very large sales were made towards the end of August at advancing prices, but as is only natural, part of this advance has been lost. The "forward" market, however, was at a standstill. Owing, presumably, to the sales of fine lots, at the only auctions held, viz., on August 28th, there was practically no good quality catalogued, only browns and specky for the most part being offered, and these had all along been difficult to sell. Out of 310 tons Malaya and 78 tons Ceylon offered at the August public sales, only about 25 per cent., we heard, were sold. Any rate of the commoner grades, prices ranging from 1s. 7½d. to 1s. 10d. per lb., against 2s. 1½d. to 2s. 2½d. for standard crêpe and ribbed smoked sheet, and 2s. 11d. to 3s. for Hard Fine. This week (September 11th), report Messrs. Figgis, finds the demand for Eastern plantation rubber rather quieter with prices lower at about the following: Standard Crêpe, 2s. 1d. per lb.; Standard Crêpe, October-December, 2s. 0½d. per lb.; Ribbed Smoked Sheets,

2s. 2½d. to 2s. 3d. per lb.; Hard Fine Pará, spot, 2s. 9d. per lb.; Soft Fine Pará, 2s. 1½d. to 2s. 2d.; Scrappy Negroheads, 1s. 8d. to 1s. 8½d. per lb.; Caucho Ball, 1s. 7½d. per lb.

No auctions have been held since the one on August 26th, and it is uncertain when the next will take place, there are none advertised for September 22nd.

Coco-nut Products, &c.

Messrs. Mordaunt Bros. tell us that "market reports of the above are still held back owing to the very slack trade in all positions. Meanwhile," they add, "with regard to the coco-nut oil market, in the last few weeks there has been very little doing, sellers predominating in all positions, and there is little disposition shown to operate forward in either Cochin or Ceylon coco-nut oil. During the last week a good deal of oil arrived in the river and has been pressed for sale, as low as £43 c.i.f. being accepted to clear some hundreds of tons of oil. This shows a fall during the last four weeks of about £4 a ton. We close to-day (September 11th) rather steadier with a little more inquiry at the lower level, but generally speaking the demand is extremely poor. Owing to the Hamburg palm kernel oil crushers all being closed down, there is a likelihood of a very large business being done with the London and Liverpool crushers in future in this article, and it is hoped that the bulk of the trade which has hitherto been carried on in Hamburg may come to this country." Prices of copra are quite normal, and have been so for some time, certainly during this month, which opened with Java afloat at £25 15s. buyers; Macassar, £25 10s.; Penang, £24 12s. 6d.; and Singapore, £24 12s. 6d. c.f. and i.

At that time (September 4th) Messrs. Goodlake and Nutter reported that the coco-nut oil market was inactive, with sellers of "arrived" and "afloat" oil at 45s. c.i.f. London. At that time buyers seemed to have been holding off for lower prices, but sellers kept fairly firm in their views. Cochin Oil: There was more inquiry, and we would quote 50s. per cwt. c.i.f. London August-September, September-October shipment. Pressed Coco-nut Oil: There had certainly been more demand for both near and forward positions, but with very little oil, however, offering for September and October, we quote for September 41s. 9d., and October 41s. 3d., although business had been done at considerably less money for the latter position. There would be sellers of November-December at 39s. 6d. in shipping casks. Spot prices: Cochin Oil, £54 to £56; Ceylon Oil, £48 to £50.

After this came Messrs. Mordaunt's sale at £43, whilst Liverpool quoted Ceylon at £48 to £50, and Cochin at £51 to £53. With palm oil, the only news we have come from Liverpool on September 11th, when we heard there had been a continued good inquiry for Lagos and Softs, and that these descriptions were from 5s. to 10s. dearer on the week, but others have ruled difficult to move, and quotations are partially reduced 10s. per ton. Sales fully 900 tons, included spot Hards £25 15s. and Lagos £30 7s. 6d. to £30 10s., and Hards afloat and for arrival £25 15s., all transit, with Benin spot £25 10s. per ton quay.

Sugar.

Unlike the others, the sugar market is all life and energy, chafing at not being allowed to go forward and secure higher prices which many believe must be given, in spite of Government or other interference, so much so that the firm of Tate is reported to be holding aloof of the market with the exception of pieces. Cutting short pages of sugar news, interesting and important and very descriptive of the battle being carried on between the producers against consumers (the Government and refiners here and elsewhere) to force prices up to what is considered by those holding the raw sugar to be a fair price, we will just quote the following transactions, say:—

Three hundred bags Crystallized Trinidad at 28s., and another 50 tons at full prices. 904 bags Crystallized Demerara were bought in. Barbados Muscovado sold at 22s. 6d. to 22s. 9d. for good grocery. Demerara syrups: Low grainy dark, 22s.; low middling grayish, 17s. 6d.; good yellowish, 21s. Trinidad Centrifugals, good grayish, 24s. Crystallized Surinam sold, middling grayish and yellowish, 27s. 6d. to 27s. 9d.; low middling to grainy brownish syrups, 19s. to 19s. 6d. Good brownish Guatemala, 20s.; fine yellow, 24s. 9d. to 25s. White Java sold at 24s. 6d.; September and/or October, 23s. 9d. c.f. and i. London. Other sales included Crystallized Demerara sold at 29s.; Trinidads, 28s.; St. Lucia, 28s.; Jamaica at 28s. Demerara syrups sold at 22s. White Mauritius on the spot realized 29s. 6d. Further good sales of White Java have taken place in shipped at 24s. to 24s. 6d.; September, 23s. 9d. to 24s.; and October, 23s. 6d. to 23s. 9d.

Looking across the water, the *Louisiana Planter* sums up the Anglo-American situation very well by telling us that "it may roughly be said that almost the whole crop of beet sugar, and not far short of half the total crop of the world is produced in the countries now unfortunately at war, namely, France, Russia, Germany and Austria, and it must further be noted that they supply the United Kingdom, either in the raw or refined state, with fully 75 per cent. of their consumption. A not inconsiderable proportion of the male population of these countries are under arms, and apart from possible damage due to the direct result of warlike operations, it is not impossible that the harvesting of the roots will be interfered with and the crop for this season be reduced. It is fervently hoped that the falling off will not be of sufficient extent to be really serious, but it must be admitted that it may, under possible circumstances, be so great as to preclude the hope of any return to reasonable prices in this article for a more or less indefinite period."

Meanwhile, August closed with: "The New York Sugar Combine making frantic efforts to hold down the prices of sugar in the face of conditions that justify an advancing market until white granulated sugar reaches ten cents per pound, which it is sure to reach within a few months. No one now expects over half a sugar crop from beets in Europe. Four million tons are practically already lost there. England must have two million tons of sugar, or advance prices to levels that will reduce consumption, and yet sugar is the cheapest great staple food now

available. She has ordered her exporting colonies to hold all their sugar subject to the control of the English Government as to price and destination. These sugars thus controlled amount to but half a million tons, and England must compete with the United States for the coming Cuba crop, now four months distant. Every day that the European war continues accentuates the sugar famine now confronting sugar consumers face to face.

"In the face of all this the New York Sugar Refining ring is endeavouring, by every known device, to depress sugars. Our readers should carefully study our New York sugar market reports, and especially the excellent digest of the whole situation given by the A. H. Lamborn Company in this issue. The sugar refiners have inadequate supplies; they cannot deliver sugars promptly for that cause, making buyers wait from seven to twenty days for delivery, and yet they marked refined sugars down $\frac{1}{4}$ to $\frac{1}{2}$ cent, making some slight loss to frighten raw sugar holders and then to raid the sugar market, much as Morgan handled the New Haven railroad.

"We have every reason to believe that white sugars will reach 10 cents. before January 1st, and this raid on sugar prices now making by the New York combination, in order to get the remnant of the Cuban crop, should die the ignominious death it deserves. The holders of Cuban sugars—the only sugars now to be had anywhere—should hold on to them for still higher prices than any thus far realized." This being so, and in face of the news from sugar men on this side, and also from the sugar-beet centres in Europe, nearly three weeks after the above was written, one doubts whether the Government can keep prices down as they have been doing, no matter how quickly the war is brought to a close, and that will not be in time to benefit the beet crop, especially as in August we received only 35,775 tons of sugar in the United Kingdom, against 184,097 tons during August, 1907, and 144,000 tons in 1912. If the comparative imports run up to Christmas on these lines a substantial rise in price must be looked for.

The London Cocoa Market.

By THE EDITOR.

"WHAT is the news?" asks each cocoa man of the other as they meet. "None," seems the universal reply, and that is about all that can be said, although if I left the remainder of this issue as a blank I am afraid my readers would not maintain the high opinion of TROPICAL LIFE which I am quite sure everyone holds of us. The pity is that one cannot altogether claim in this instance that no news is good news, for until all kinds of cocoa are selling briskly, most of our readers will claim that my news is no good at all—at any rate, to them. No sales were held on September 8th, and at the time of writing (September 15th) the very few lots sold this week can hardly be said to form a market. No wires have come across from Guayaquil since the middle of July, so we have had no receipts of cocoa at that centre either to the end of August or the middle of September. Letters to hand give

the figures to the end of July (730,500 qtls., against 405,800 last year, and 533,200 in 1912), and so we must evidently expect to gather in our news by this slow method until further notice. Too late for publication last month, I received the figures from M. Anthime Alleaume at Havre for mid-August, and also to July 31st. Those to August 31st have since come to hand, so I can include them with the figures to August 15th, say:—

	Aug. 15th.			Aug. 31st.	
	1914.	Value.		1914.	Value.
<i>French Stock—</i>	Bags.	Fcs.		Bags.	Fcs.
Accra ...	78,125	—		77,607	63 to 67
Bahia ...	20,148	62 to 75		20,028	62 „ 75
Venezuela ...	90,726	70 „ 200		93,556	70 „ 200
Grenada and O.W.I.	2,823	—		1,699	—
Guayaquil...	53,480	70 „ 76		53,740	70 „ 76
Haiti ...	17,055	55 „ 70		15,388	55 „ 70
Pará ...	20,420	64 „ 70		20,779	64 „ 72
San Domingo ...	2,888	60 „ 66		3,268	60 „ 66
Trinidad ...	48,511	66 „ 71		47,118	66 „ 70
San Thomé ...	5,029	71 „ 72		5,029	71 „ 73
Divers ...	12,323	—		11,969	—
Totals	351,529 bags			350,181 bags	
Stock Sept. 15th,	337,979 „			201,829 „	

The Lisbon figures just in show 16,048 bags landed, against 12,877 delivered, and the stock on August 31st was 55,116 bags, against 51,945 at the end of July and 50,432 bags on August 31st last year.

Coming now to the Board of Trade figures for the United Kingdom to the end of August, these are returned as under, showing that our deliveries for Home Consumption for August, probably on account of the Government's requirements, were nearly the same as last year, whilst with the foreign manufactured article the landings were heavier, but the deliveries a good deal less, some 50 per cent. below the landings. Of raw cocoa, the landings during August only were 1,840 tons, against 2,142 last year, and 1,619 tons in 1912, whilst deliveries for Home Consumption totalled 1,557 tons, against 1,572 last year, and 2,093 tons in 1912, and so for the eight months the returns are as follows:—

<i>Raw Cocoa only—</i>	Landed.	Del'd H.C.	Exported.	Stock (Aug. 31st)
	Tons.	Tons.	Tons.	Tons.
Jan.-Aug., 1912—	23,621	17,722	4,082	11,164
„ 1913—	24,860	18,072	4,755	10,658
„ 1914—	28,889	19,251	4,525	14,889
	Incr. 4,029	Incr. 1,179	Decr. 230	Incr. 4,231
<i>Foreign Manufactured—</i>	Landed.	Del'd H.C.	Landed.	Del'd H.C.
	Aug. only		Jan.—Aug.	
1914 ...	1,093	715	7,264	6,874 tons
1913 ...	998	860	7,657	7,230 „
1912 ...	789	742	5,979	6,128 „

At the end of July the total stock of cocoa in the United Kingdom was 14,925 tons; at the end of August, as shown above, it was only 36 tons less, which, at 15 bags to the ton means only 540 bags reduction, whilst the stock in London has fallen away some 7,000 bags during August. This shows that up at Liverpool or elsewhere the invisible stock has increased, and, on looking up the figures, I find they had up there just over 17,000 bags at the end of August, against 12,000 bags at the end of June (no figures

published to July 31st), to say nothing of their invisible stock.

In London the figures on September 12th were:—

<i>London Stock—</i>	1914.		1913.		1912.
	Bags.		Bags.		Bags.
Trinidads ...	9,639	...	13,023	...	7,680
Grenadas ...	7,778	...	5,368	...	4,607
Other W.I. ...	5,692	...	4,518	...	12,556
British Africa ...	10,328	...	9,672	...	6,258
Portuguese Africa	1,925	...	4,654	...	8,580
German Africa ...	1,548	...	2,253	...	7,078
Ceylon and Java ...	14,010	...	17,716	...	16,909
Guayaquil ...	23,026	...	13,146	...	41,072
Brazil and Bahia	2,362	...	703	...	3,027
Other Foreign ...	13,759	...	9,743	...	9,313
Totals ...	90,067	...	80,796	...	117,080

Referring to my remarks last month *re* the absence of statistics on account of the war preventing our receiving the *Gordian* from Hamburg, one cannot help noticing how lost to the world the Gold Coast is, for neither London nor Liverpool publishes any news of her, either her exports, weather conditions, &c.; and as out of sight means out of mind, I consider the Gold Coast cocoa is suffering now for want of a trumpeter, or at least a fair amount of publicity. We know all about Jamaicas, Trinidads, Grenadas, Bahias, St. Thomés, Guayaquils, &c., but nothing about the Gold Coast, and this being so, I do not wonder that whilst Trinidads and Jamaicas have been in good demand and selling steadily at full prices, Gold Coast cocoa is dragging and not doing well. No doubt the traders on the Coast know their own business, but it is both strange and stupid that those not in the ring cannot secure particulars of our own colony's output, and that the largest producing centre in the world. The last West Indian mail to hand was, of course, full of the war, the report of which had pulled down prices a good deal, although very little cocoa was being received. Grenada, for instance, shipped under 900 bags during the month ending August 20th, and in Trinidad they are not at all pleased with the weather, which will curtail the coming crop and make it late. As things are to-day it is difficult to sell cocoa, and the few prices spoken of, based probably on the Government purchases in London, as being the only public sales known, are unreliable for those not having the cocoa (principally good Trinidads, Grenadas, St. Lucias, or Jamaicas and Guayaquils) that the Government is buying; those, therefore, who have any should send it over to London or America as soon as possible, and once they get a bid on the basis, let us say, of 56s. for fine Grenadas, I consider that they would be wise to take it. No one can say what will happen when the Continent is open again, and the Havre accumulations let loose on a broken-up Germany, hitherto the biggest buyer, that will have no money to buy chocolates with until the war is over, and neither will Austria, but her demand was always a negligible quantity. When the war will be over one can only conjecture; but when the results as regards the normal demand on the Continent will come again for rubber and cocoa no one can tell, for after things have settled down we still must wait to see how the new level will compare with the old, for should (as is expected) the map of Europe be much changed, the

new owners may not push the sales of these articles with the same vigour and success as did those who controlled the markets up to the end of July. For these reasons, therefore, I certainly would recommend all who can do so to sell their cocoa before the end of the war.

Meanwhile there seems to be trouble again in Bahia—not war, but climatic trouble. One reliable authority writes me that things were not good in June (except in Ilheos, which hopes to have a good crop), and now they are so far worse that the total output seems likely to be 150,000 or 200,000 bags short. What the trouble is—too much or too little water—I cannot say, but my authority is not given to superlatives, so I take it that the planters up in Bahia are in as bad a pickle as they were when the floods overtook them only a few months back. If the trees are only “resting,” maybe what they are fretting over now will be a blessing in disguise, for there will be plenty of cocoa to go round for some time to come, and the check they are now receiving may be made up in a year’s time when the demand is improving, and it will be much the same with Trinidads.

Coming to the question of values, we are touching on delicate ground, for no one can give a true idea of these. All one can say for certain is that the following sales have been effected since mid-August, the Government, as a rule, being the buyers:—

Trinidads.—Good to fine good red, 59s. to 62s., but latterly at 61s. and 60s. only.

Grenadas are valued nominally up to 58s. for fine, but supplies are practically nil, and I feel sure that manufacturers would not pay within 2s. or 3s. of such values.

Jamaicas.—Good red has been selling up to 56s. and picked lots 57s., whilst ordinary unfermented have sold down to 50s.

Dominicas, on the basis of 56s. to 58s. for good to fine Grenadas or St. Lucias, are worth 54s. to 55s. for good red, but no sales are reported.

Java has been selling at 70s. for good bold, being a drop of 8s. to 10s. on previous business done.

Ceylons are worth up to 75s. for good to fine bold, were any to come up for sale, but such cocoa has not been offered except that mentioned below.

Guayaquils.—No Arriba has been sold, and their nominal value is put at 58s. to 64s., against 55s. to 56s. for Machala, and 55s. to 58s. for Caraquez, whilst sales of Caraquez have been carried out at 55s. to 56s., and of Balao at 57s.

Liverpool reports a stagnant market without any sales. In London the nominal value of Accra kinds is placed at 47s. to 50s., against 55s. to 56s. for San Thomé or Cameroons and 40s. to 50s. for African kinds in Liverpool.

At the sales on September 15th some of the cocoa was sent across from Havre. At first it looked as though the Government would again be buyers, but this was not the case. Hardly any very fine Grenadas were up, but the home trade’s idea of values for good red marks seems to run around 52s. to 53s., better value for this and other kinds coming from export buyers. Finally 55 fine Trinidads sold at 60s. to 61s., and 80 mid red at 57s. to 58s. Of 750 Grenadas, fair reddish realized 51s., good to fine, 52s. and 53s., with a few at 54s. to 55s.; good to fine Jamaica realized 52s. to 54s., and fine St. Lucia 54s. Good bold Ceylons were offered, but had no bids.

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. X.—No. 10.]

OCTOBER, 1914.

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By W. ALEX. MUIRHEAD,

Staff Serjeant, Royal Army Medical Corps; formerly on the Staff of the
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Instructor at the School of Army Sanitation, Aldershot; Associate, Royal
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Water Supplies—Food—Collection, Removal, and Disposal
of Excreta and Refuse—Habitations—Sanitary Law and
Practice—Appendix.

JOHN MURRAY, Albemarle St., London, W.

"Tropical Life" during the War.

ONE of our readers, a prominent journalist who specializes in international finance, writes as follows concerning the leading article in our September issue: "While London journalism is in many cases withering in agony you tantalize us by your 'Business as Usual' look of TROPICAL LIFE just to hand, and its shockingly prosperous aspect. Many congratulations on your leader on 'Financing the Trade Boom.' I enclose an article I have just written for the *Manchester Daily Dispatch*, and hope to follow it up by one giving a practical scheme for the class of bank that could render excellent service just now."

"Whilst writing I must congratulate you on your leader in the September issue, and say how glad I was to see such sentiments in print."—From a Birmingham reader.

A new subscriber in Colombia, South America, writes: "Your paper was recommended to us by the Pan-American Union at Washington, as being the best on subjects pertaining to Tropical Agriculture; please, therefore, send us your paper, and let us know amount of the subscription to same."

The American View of the War.

So much has been claimed by both sides as to the American view of the European conflict that it is important to note what an unbiased but competent journalistic judge, in the shape of *Current Opinion*, has to say on the subject. This well-known monthly, to which we have often had reason to refer, is edited by Edward J. Wheeler, for the Current Literature Publishing Co., at 134, West Thirty-ninth Street, New York City, U.S.A.; it costs 25 cents a number and is particularly useful as a review of American opinion generally, since it gives the opinion not only of itself but of the leading American journals as well. Speaking for itself, *Current Opinion* said at the end of September, "It is the wickedest, most unbelievable event history has ever recorded. . . . Germany has shot her first bolt with wonderful power and precision and it has failed of its purpose, her ally has had her armies shattered by the Russians, and had to change from the offensive to the defensive against the Serbians. . . . The British troops seem to have taken the chief force of the tremendous impact in the West, and by dogged resistance to have kept the lines of the Allies unbroken."

Speaking of the German retreat from close to Paris, the New York *Evening Sun* says that "Like Napoleon, the Kaiser has gambled desperately, splendidly, put

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all his fortunes on a single throw, and the dice have gone against him." "Nothing in the German appeal to American opinion," said the *Springfield Republican*, "disposes of the suspicion that responsibility for the war lies with Germany and Austria; on the contrary, their publication changes the suspicion to certitude." "Most educated Americans," Dr. Charles Eliot, ex-President of Harvard, is persuaded, "hope and believe that by defeating the German barbarousness the Allies will only promote the noble German civilization. Great Britain, France and Russia are fighting for freedom and civilization." The *New York Times* holds that the three dynasties of Germany, Russia and Austria are responsible for the war. "The secret of this, the strangest anomaly of the times," says the *Philadelphia North American*, "lies in the fact that German autocracy is wholly devoid of international morality."

According to the *Daily Telegraph*, Mrs. Henry Clews, the wife of the well-known American banker, on her arrival at New York, told the reporters that the stories of German atrocities in Belgium had not been exaggerated, and she herself had personally investigated a number, with the result that she found that half had not been told. It was a war, she said, ruthless beyond description, and the Germans, so far from trying to conceal their malpractices, openly defended them on the ground that the life of a Prussian soldier in the present crisis was worth more than that of any civilian, no matter what age or sex. She and others were openly insulted in the streets of Munich many a time. "It is not because the Germans love us so that they foregather at the railway stations and cry 'Hoch! Hoch!' when a trainload of American refugees passes through, either," she continued. "I was told, on an authority which I would not think of questioning, that the demonstrations are made by Imperial decree."

Speaking at Newcastle, Lord Haldane, our ex-Minister of War, whom no one charges with fanatical ideas against Germany, told those present that "we were at war because it was our sacred duty to be at war. We were fighting for the right. He was not one of those who even now failed to respect the finer qualities of the German race, but all those great qualities had been prostrated to an unworthy purpose. They had been placed under the domination of that military spirit which should be exterminated. One indispensable element in the treaty between the Allies was that the dominant spirit of militarism, which had prostituted the German nation to a wicked purpose, should be crushed and broken, so that we, and those who acted with us, might live free from its terrors. I do not underrate the magnitude of the task that lies before us," he added, "but I trust the shock is over, and the real struggle is now beginning under much less favourable circumstances for Germany than was the case two months ago. Set your teeth and stick out. Up to now the resolution of the nation has been splendid, and the signs are that it is increasing and not diminishing. We are fighting for the life of the nation."

And so the tale runs on; those who wish to know more must, however, go to the original sources to study it.

The Future Director of Agriculture for San Thomé in London.

TOGETHER WE VISIT KEW AND THE IMPERIAL INSTITUTE.

SINCE our last appearance we have been favoured with a visit from Mr. Amando Cortesao, well known in Portugal on account of his investigations into the improvement of economic products, especially wheat, by systematic plant-breeding and cross-breeding, or, to use a short but suggestive term, by "Luther-Burbanking" them. Mr. Cortesao has been for some months studying cacao and general planting methods in Jamaica and Trinidad, in the West Indies, and at one or two centres in South America. He will be leaving shortly to establish a Department of Agriculture in San Thomé, over which he is to preside as Director. Together we inspected cacao samples in Mincing Lane, we interviewed the leading makers of drying apparatuses, and visited the Imperial Institute, over which Dr. Henry was kind enough to conduct us and show our Portuguese visitor the museum, laboratories, &c., and, in the basement, the very complete experimental rubber machinery plant made by our old friends, Messrs. David Bridge and Co., Ltd., of Castleton, Manchester, by which you can make latex into rubber, and raw rubber into the finest vulcanized article for sale; the rubber bands made throughout by this machinery and tested, first for strength and then for breaking strain, showed a stretch and strength that astonished us.

On October 6 we paid a visit to Kew, where we had the pleasure of meeting Sir David Prain, the Director, who was much interested in our visitor's account of the cinchona trees in the upperlands of San Thomé, and advised him to take care of same, and when making sulphate of quinine to remember that valuable rival properties still remain behind that can be equally or nearly equally useful, but since they will not crystallize, inexperienced makers are inclined to pass them by. After lunch Mr. Taylor showed us over the houses, especially those containing cacao, coffee, rubber, &c., carefully explaining the methods of packing them for export, and the best size and age of the seedlings for export. Needless to say he was thanked warmly for the trouble he took over us.

Whilst going round the houses at Kew we noticed that moist brown wood shavings were constantly to be seen around the pots. Asking our guide (Mr. Taylor) whether these were not cedar, he told us "Yes," and then added that they got their supplies from Messrs. Pears, the soap makers (now amalgamated with Messrs. Lever Bros., Ltd.), who bought it from the pencil-makers and extracted the scent from it previous to passing it on to Kew. If it is worth while for a firm like Pears to extract scent from cedar waste, surely many of our readers who go in for cedar-lumbering should also find it profitable to do the same with the tons of chips they accumulate in a year. The idea is, at any rate, worth considering. This reminds us that some of our contemporaries are discussing the report that an American firm of lead-pencil manufacturers is seeking a concession for the establishment of a factory in the State of Travancore, where it is believed both the plumbago and the cedar wood are to be found.

The Utilization of Manure Waste, Cattle Manure, &c., for Tropical Crops.

ARISING out of the remarks on p. 162 of our September issue, regarding the utilization of house refuse, &c., for manuring estates until there is more money about, or supplies of potash are again available,* we beg to draw attention to the Quarterly Journal of the Scientific Department of the Indian Tea Association which recently published some notes with regard to the use of manures in tea soils which should be noted; we regret to see from these notes that in the tea districts of North-East India there has existed for some time a prejudice against the use of inorganic or, as they are more commonly termed, chemical manures, and that this prejudice is not without some justification; if so the objections raised are surely avoidable. In countries, we are told, where agriculturists have had a large experience of the value of different manures, a higher relative price is paid for manures containing organic matter such as oil cakes, &c., than for purely inorganic manures such as nitrate of soda when both manures are used to supply nitrogen, because it has been noticed that arable land, to which only inorganic manures are added, slowly loses its tilth and becomes less fertile, whereas those soils which have received the manure in an organic form suffer no such deterioration. This, the advocates for cake claim, can easily be explained. Inorganic manures, they tell us, add no organic matter to the soil and constant cultivation depletes the soil of what originally existed there. The soil in consequence gradually becomes poorer and poorer in humus, particularly if the crop which is grown in it is removed in harvesting, until a time is reached when the fertility of the soil is affected. On the other hand, the employment of organic manures adds organic matter even if in only small quantities, and this on decomposition replaces, at any rate in part, the humus that is lost through cultivation. It is therefore necessary to supply organic matter in some form if inorganic manures are being used. If this be done the humus content of the soil will not suffer depletion, and inorganic manures can be employed for any number of years, if suitably chosen, without any deleterious effect on the soil. In tropical and sub-tropical countries subjected to a heavy rainfall and a high temperature the decomposition of humus is very rapid, and the addition of small quantities of organic manure, such as five maunds per acre of oil cake, will not be sufficient to maintain the necessary quantity of humus, although some of the value of such applications is undoubtedly due to the organic matter they supply. The further addition of organic matter will in any case be necessary.

Cattle manure and lime manure are both possible sources of organic matter, but the quantity that is available for application allows of but very small areas being treated with an adequate quantity. The cost

of transport is also considerable. They should, however, be employed wherever possible. Another source of organic matter is top-dressing, and this is of particular value, since it is already partially decomposed organic matter, and has been converted into humus. The use of this material will, for this reason, frequently give results more rapidly than the above-mentioned forms of organic manures. There is, however, always the possibility of top-dressing material being of an acid nature, and precautions should be taken by the addition of lime to the soil, preferably as crushed limestone, to neutralize the acids that may be present in the top-dressing. A word of caution must be said in this connection. It is essential that the top-dressing employed should contain a high percentage of organic matter or humus. Much of the top-dressing that has been and still is used in gardens is quite unsuited for this purpose, since it contains but a small quantity of organic material and often a high percentage of clay. Such top-dressing will tend to make the soil to which it is added heavy, and if the soil is already stiff, the last state of the soil will be worse than the first. The same amount of harm cannot be done in this manner to a light sandy soil, and the texture of the soil may be even improved, but the addition of organic matter has still not been accomplished by the application. Except in case of actual peat, a casual inspection of the top-dressing material is of no use in determining its value and may lead to erroneous conclusions. The top-dressing material may have a dark appearance and lead to the supposition that it is a material of considerable value, but analysis may show that it is by no means so rich in organic matter as its appearance would indicate. Such instances are by no means uncommon, and in view of the impossibility of judging the value of a top-dressing soil from mere inspection, it is strongly recommended that an analysis of the substance be obtained before it is used.

Before leaving this subject, however, it is just as well to remember that you can have too much even of a good thing and therefore even of lime. "An unconscionable amount of good humus and potential plant food is burned up or held in a soluble form by overdoses of lime," wrote O. W. Barrett, in our book on "Soil and Plant Sanitation," p. 19, "digesting a modicum of such raw material is a boon to the hungry root, but when once dissolved the surplus is carried beyond the reach of the root-hairs and the gaping drain gets it. One overdose of lime may impoverish the soil for a period of several years, but properly administered there is no better 'fertilizer.'"

All this is sound advice, and all very well as far as it goes. The value of poonac or oil-cake and also, when prices permit, of Homco oil meal cannot be over-estimated, but we still maintain that were small amounts of nitrate of soda to be added to any of these organic manures, whether poonac, meal, cattle droppings, lime, green manures, compost heaps or what not, the crops when requiring nitrogen would be all the better for the nourishment that such applications give them. We say this because organic manures always, or nearly always, require a reinforcement of plant food, especially nitrogen. As we said in our paper on "Manuring Rubber" at the last London

* This reminds us that whilst unable to ship potash alone, both the International Guano Works at Zwynndrecht, Holland, and the Amsterdam Superfosfaatfabrik, Amsterdam, inform us that they can supply complete manures containing potash should such formulas be required. Meanwhile we notice that Mr. Robert Birnie, the potash expert at Bangalore, writes in *The Planters' Chronicle* of September 12th that he has closed his office until the war is over.

Rubber Congress (see TROPICAL LIFE for September, p. 173) no cut and dry formulas can be recommended; because a certain one gives good results on your neighbour's estate it does not signify that it will do so on your own. In making the following, or the foregoing, remarks, therefore, we do not pretend to say that they are to be followed out in every case, but only that they should be taken into consideration, and perhaps tentative applications first made, before other advice is blindly followed. Subject to the above warning, therefore, we strongly advocate, as a rule, the addition of nitrate of soda when applying organic manures, as even with poonac the nitrogen content is slow acting, and, more often than not, insufficient for the needs, and especially the immediate needs, of the crop. In any case we would suggest that the application of purely organic manures is seldom, if ever, an economical way of applying plant food. "There has existed for some time," we are told a little way back, "a prejudice against the use of inorganic or, as they are more commonly termed, chemical manures . . . because it has been noticed that arable land to which only inorganic manures are added slowly loses its tilth and becomes less fertile, whereas those soils which have received the manure in an organic form suffer no such deterioration." Surely such statements are unnecessary unless planters, through inexperience, have been known to apply nitrate of soda to the soil without mixing it with humus, organic matter, green manure, &c., though we can hardly imagine anyone doing so; but should there be any such, let them at once change their methods, and whilst applying all the organic manure needed, or that they can secure, let them, as a rule, not forget to add that *wee drappie* of nitrate of soda now and again that the plant, like the planter (when it's real whisky) likes so much also, and which is good for it when given wisely and in moderation. Certainly when there is a tendency for the supplies of humus to be short there is no reason, especially in these hard-up days, for tea planters to pay more for the nitrogen contents of the manure, organic or inorganic, that they are applying to their plants, and to such, therefore, we beg to commend the above remarks, and certainly would suggest that before being prejudiced against inorganic manures, especially nitrate of soda, they should, when applying organic manures, add small quantities of nitrate of soda when nitrogen is needed. The second portion of these notes will, we believe, emphasize the above remarks.

(To be continued.)

The Effect of Copra Acids on Metals.

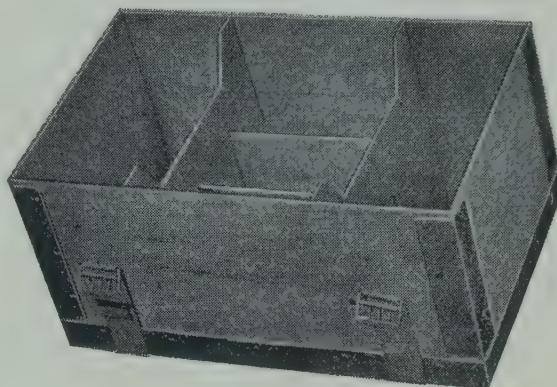
To the Editor of TROPICAL LIFE.

DEAR SIR,—The article you published in the September issue, by David S. Pratt, on the "Copra Spoilage and its Effect upon the Bronze Propeller Shaft" is very interesting, but I venture to suggest that the corrosion of the shaft was caused by the galvanic action which takes place between steel and gun-metal when submerged in sea water. For instance, your photograph of the shaft is absolutely similar to one I examined some years ago on board a launch. It had a steel shaft, cased in gun-metal, and a gun-metal screw; the gun-metal casing of the shaft had shifted about 1 in. away from the screw and exposed the steel shaft. This, a 3 in. shaft, was not, when I saw it, more than about $2\frac{1}{2}$ in. in diameter and eaten away, the corrosion being caused by galvanic action, as above mentioned. It would be interesting to know whether the screw of the *Nippon* was steel or gun-metal; if it was gun-metal, of course no such action as I mention would take place, unless the shaft came in close proximity to a steel or iron sternpost, in which case the galvanic action would take place. The launch mentioned above, being a private one, was carrying no cargo whatever to affect the shaft.

Believe me, yours faithfully,

LESLIE RADCLIFFE, A.M.I.C.E.
London,
September 28th, 1914.

For the War. No. 2.



A FIELD VETERINARY CASE.

Supplied to the War Office by Messrs. Venesta, Limited. These chests are partitioned inside for carrying compressed bandages and veterinary instruments, &c.

They are made of plywood and are proving of great service in the present war, their chief advantage being of course strength combined with extreme lightness.



"THE results of the discussion which went on from day to day in the tents and pavilions at the London Rubber Exhibition." Mr. Lyne told a representative of the *Times of Ceylon*, when interviewed by him on his return to Ceylon, "seemed to indicate that a more simplified method of preparation, as smoked sheet is preferable to crepe, for which few had a good word to say. At the same time

crepe, will, no doubt, continue to command a good market because it is so clean and dry, manufacturers preferring it for certain classes of goods which do not require special nerve. The only criticism passed on sheet was that at times it was over smoked."

As to the best sample in the exhibition, manufacturers agreed, said Mr. Lyne, that this came from Pitakande, near Kurunegella. Several manufacturers stated that if they had to award a prize for the best sample of rubber shown they would give it to this block of curly scrap, into the production of which no acid nor smoke had entered. In the first portion of our July "Ramble Round Raw Rubber," we devoted twenty-five lines (p. 135) to this block.

Tobacco Planting.

PART IX.

HYBRIDIZATION.]

THE Philippines, like India, or rather the authorities in charge of the tobacco producing industries of those centres, realize that it is absolutely necessary to improve the strains now being grown by the natives. José Paredes Tirona, writing on the Hybridization of Tobacco in the *Philippine Agriculturist* (vol. iv, No. 1, p. 1), the organ of the College of Agriculture, Los Baños, Philippine Islands, tells us that there are two means by which new and improved varieties may be established, viz., selection and hybridization. Selection evolved the White Burley variety from the older Red Burley plant, for a separate and careful culture of the seed of the marked plants was made with the few selected plants, until a distinct variety was established. Focke, a contemporary of Darwin, noticed according to Tirona that the hybrids were more vigorous than the parent kinds and that they often blossomed earlier. Shamel (we believe of Connecticut, whom Tirona describes as being one of a body of men who have done most to improve the types of tobacco by selection and hybridization) and Cobey recommended the following plan for utilizing hybridization as one of the methods of breeding:—

"The best plan which can be followed in the case of crosses is to grow 100 plants of each cross and carefully note the characteristics of the hybrid plants. It will be found that there will be a considerable variation in the plants of the first season. Seeds should be saved from those plants which are the most desirable and which show the greatest improvement over the native varieties. The next season a large area can be planted from this seed; and if the crop is uniformly of the type desired, enough seed can be selected the second season with which to plant the entire crop the third year."

The whole of this article is worthy of attention, especially as many crosses are discussed, and illustrations included, showing how to protect the seed heads with manila paper bags to prevent any cross fertilization. We believe that the *Philippine Agriculturist* is obtainable in single copies, but are not sure of the price. The foreign subscription is \$1.50 a year. A note to our old friend Professor Copeland, Dean of the College of Agriculture, Los Baños, Philippine Islands, will no doubt bring along a copy.

Even if available, according to Mrs. G. L. C. Howard, M.A., personal assistant to the Imperial Economic Botanist, Pusa (Mr. A. Howard, M.A., F.L.S.), the chances of improving the quality of Indian tobacco by the introduction of a new variety from America are not great.* It will be necessary, Mrs. Howard tells us, to build up by hybridization new kinds of tobacco suited to Indian conditions of growth, which possess in addition the qualities necessary to obtain a better price. Fortunately the introduced American kinds, although they lose their colour by the native method of curing, nevertheless maintain their good texture and flavour, the chief points in which the Indian tobaccos are deficient. Thus by combining these desirable qualities with those of an indigenous tobacco

which is robust, acclimatized, and possess a suitable habit of growth, a very great improvement might be effected. Unfortunately, although tobacco is grown over so large a portion of the world, very little work has been done on the hybridization of this crop, and little is known as to the inheritance of the various characters which are of economic importance. As in hybridization lies the greatest chance of producing a permanent improvement in the tobacco grown in the plains, and as it is possible to obtain at Pusa all the facilities necessary for such an inquiry, it was decided to take up the question and to make a thorough investigation of inheritance in this crop . . . but it will probably take some years to obtain a complete knowledge of the subject. The Agricultural Research Institute at Pusa has, we know, published several *Memoirs* on the improvement of tobacco, the last being "Studies in Indian Tobaccos. No 3," Price in India, Rs. 3.

Regarding the introduction of new species it is interesting to note what Dr. Sketchley says in his notes on Sumatran tobacco† (p. 102): "It is curious," he tells us, "how tobacco introduced into a new country will assume in a few years a distinct type of leaf and aroma, in many cases quite distinct from the parent plant. I have proved by my own experience that Sumatra tobacco grown under tropical conditions several years in succession, from seed saved locally, has deteriorated in a remarkable manner as wrapper leaf, although it has improved in aroma and texture as a filler tobacco. Therefore, if the object was to produce first-class wrapper leaf of an even quality, from year to year, it was found necessary to import the seed direct from Sumatra each year. It is quite feasible, however, that by selecting the best plants and collecting the seed for a few years, a distinct type of Sumatra tobacco might be grown here which would be very useful to cigar makers, if not of the finest type for wrappers."

"I am inclined to think that a finer tobacco could be grown here for wrappers from Sumatra seed than the Connecticut seed leaf, which is so largely grown for the purpose in America. My experience here for the last nine years is that Sumatra leaf thickens and becomes very similar to the Java type. It is quite possible that a high-class fine leaf could be grown here on the system adopted in Florida and Cuba, that is, to cover the whole plantation with a framework of sawn timber and poles, covered with limbo or canvas, which has proved such a success in those countries."

"I would impress upon all planters who are trying Sumatra (in Rhodesia) to remember three things:—

"(1) Keep the plants growing as rapidly as possible from the time of sowing the seed to harvesting."

"(2) Do not allow a grub or insect pest to injure a leaf."

"(3) Use great care in cultivating the crop whilst growing, as well as during harvesting operations, and when handling the leaf at all times, as broken and worm-eaten leaves are useless for cigar wrappers."

(To be continued.)

† See "Handbook of Tobacco Culture for Planters in Southern Rhodesia." Department of Agriculture. 115 pp., profusely illustrated. Price, 3s. to 4s., c/o The Argus Printing and Publishing Co., Ltd., Salisbury, Rhodesia, South Africa, or perhaps a copy can be obtained from the British South African Co., 2, London Wall Buildings, London, E.C.

* *Indian Trade Journal*, April 16th, 1914, p. 91. Reviewing the original work.

Cacao Cultivation. No. XXXIII.

THE DISCUSSION AT THE THIRD INTERNATIONAL CONGRESS OF TROPICAL AGRICULTURE (LONDON, 1914).

DURING one of the debates something was said about the status or training of those who administer the laws and regulations passed by others. The law-giver may be extremely clever and highly scientific, but that does not say that the men who carry the law into effect know anything of what they are doing or why it is done. We mention this as we believe that, whilst everyone whose opinion and interests are worthy of consideration wish for the importation of plants and seed to be carried on under the personal inspection of men competent of doing the work both of inspecting and also of fumigating and otherwise disinfecting the parcels when necessary, doubt and dissatisfaction have arisen at times as to whether those who actually had the handling of the plants were really competent of fumigating or otherwise treating them without harming the goods and causing the buyer or seller unnecessary loss of time or money. Exporters and selling merchants have been led to understand that such untrained men as landing waiters or casual labourers have been told off to fumigate or disinfect the plants or stumps without any previous training. Such a course, if adopted, cannot be too strongly condemned, for it tends to destroy confidence between the public and the law and to make the regulations unduly harsh or uneven to one side, and since it is agreed that the export and import of seeds and plants should be encouraged and facilitated, anything that tends to check the interchange of them should at once be altered where possible, and the use of only specially trained men to treat imported plants should certainly be possible. It has been suggested that inspection should take place and the certificate issued at the exporting centre, so that in case of the parcel being condemned at the start, not only would a contaminating shipment be prevented from going abroad perhaps to spread trouble to other parcels on the voyage, but buyers, and sellers also, could be saved needless expense in freight and transport, especially if a man accompanies the consignment, and also to prevent actual fraud through unscrupulous sellers, for the sake of making or at least of saving money, exporting parcels that should never go anywhere else but in an incinerator, owing to their having become infected by some disease or other and so certain to be condemned on reaching their destination. This plea has a good deal to commend it, and some preliminary investigation or inspection could well be carried out by the agricultural department at the exporting centre, of course at a fixed charge, before the goods are shipped; but, as we urged last month, no plants or seeds should be allowed to move about the importing centre without the most careful inspection by thoroughly competent and trained men, or else (*not*) an angel may unawares be entertained and spread over the country as the *Oryctes* beetle was, through the doors of the Custom House in Samoa.

It should be an inviolable rule at all centres exporting plants and seeds, and that means throughout all the Tropics and sub-Tropics, that the moment trouble arises that is likely to spread, the Government should

be at once notified so that an official can be sent if necessary to advise what steps should be taken to check and cure the disease, and in any case to see that the regulation precautions are properly carried out. A schedule of diseases, pests, &c., that must be reported could be drawn up, and copies distributed to planters to be hung up in a prominent position in the house, factory or office.

The afternoon (of Friday, June 26th) discussion on cacao established the fact more plainly than ever of how widely diverse are the views of the leading authorities as to why and how cacao beans are fermented and which is the best way for the work to be done. M. Perrot was present and discussed his system, whilst Messrs. Booth and Knapp, of Messrs. Cadbury Bros., Ltd., told us about the qualities in cacao that the manufacturers desire, and Mr. Davies, the chemist, we believe, attached to the works of Messrs. Rowntree and Co., Ltd. (York), disagreed with M. Perrot and the authors who contributed the essays published in our book, "The Fermentation of Cacao." M. Perrot spoke at some length on the subject, but we must own that, with all our willingness to do so, we are unable to reconcile the different opinions advanced by the various authorities. It is the old trouble, noted in our book on p. xxii of the preface, and now M. Perrot's ideas are again different to all the others.* Mr. Booth, who read the paper by himself, and Mr. Knapp, warned planters against seeking to dry their cacao too rapidly. We are glad of this, for, as Dr. Sack said† (p. xxiii of preface in our book), "Experiments at the same time made it quite clear why the old method, by which the drying was done slowly, yielded a product which far surpassed in quality the cacao that was rapidly dried, for with a slow process of drying the reactions will continue for some considerable time. With rapid drying they will speedily cease." There is no doubt, therefore, that too much attention cannot be paid by engineers who design and make the machines, and planters who use them, to these warnings.

Further comment is not necessary now. Had there been time we would have taken part in the discussion *re* "fine" and "ordinary" grades. "I know if I were a planter," said Mr. Davis, in no hesitating tone "I would not ferment my cacao"; but at the same time care, even with the commonest cacao, must be taken to send the beans to market quite sound and free from mould externally and internally, the latter especially. Bahia this year, owing to the floods, &c., has suffered severely through the percentage of unsound cacao it had to export, so that although better prepared than is common to fair West African, it is, at present, not so sought after. It is true that some of the low quality, "cheesy" Jamaican, that we see now and then sells low, but we wonder sometimes

* We hope in a future issue to give details of M. Perrot's theories, as we did not receive them in time to include in our book, but, speaking briefly, M. Perrot's idea is to steam the beans as they come out of the pod, instead of fermenting them, and then wash and dry them as usual. To steam the beans they are placed on shelves three or four beans deep in a receptacle like a vacuum chamber, and the steam introduced under slight pressure. Uniformity of output and a fuller flavour and aroma in the manufactured article are the benefits claimed for this process.

† "The Fermentation of Cacao." TROPICAL LIFE Publishing Department.

whether, when the weather is hopelessly bad, it would not pay the Bahia planters better to ship unfermented cacao, as then the beans internally are less liable to become mouldy, and although such cacao would sell low compared with superior, it might still realize better net proceeds than much of what has been exported from Bahia this year, or is still held up country waiting for buyers.

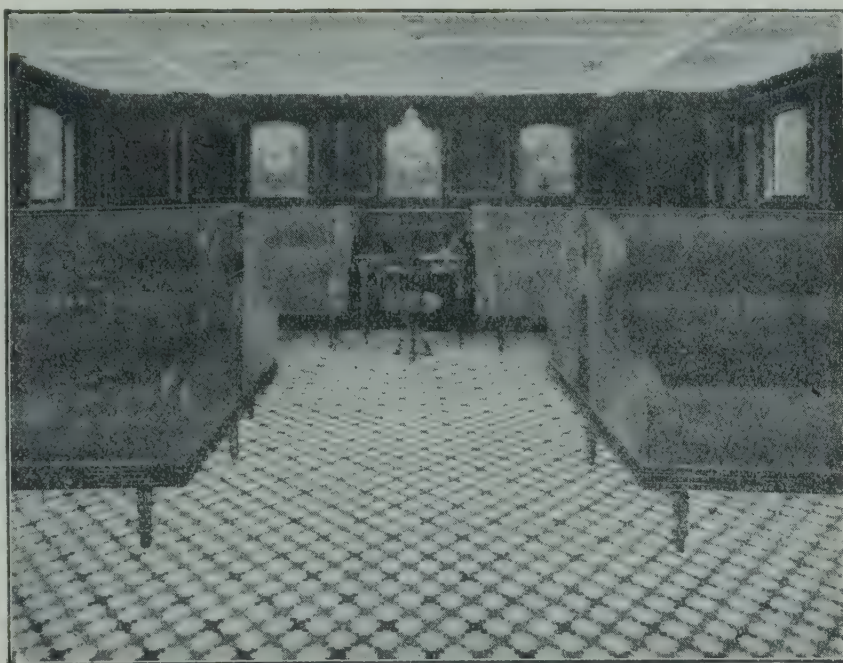
M. Leploe, Director-General of Agriculture, Colonial Office, Brussels, speaking on the paper by Mr. Claessens, also of the Belgian Colonial Office, entitled "Notes on Cacao Cultivation in the Mayumbe District, Belgian Congo," told us that the rainfall in that district was very unevenly distributed throughout the year, there being a long period without any rain at all. Although the trees gave an average yield of $2\frac{1}{2}$ lb. a tree, these spells of drought caused them to die off in about fourteen years, so that the planters were always having to put in new trees and plant up fresh areas. "The only remedy, it seems to me," concluded M. Leploe, "is to adopt some form of irrigation. Can this be done? Has anyone any experience of cacao-planting under irrigation, and with what results?" To this a planter, a Mr. Maxwell, we understood, told us during the discussion that in one district in Colombia (South America) irrigation had to be resorted to and gave satisfactory results. Unfortunately, when the meeting broke up, we were unable to obtain further particulars from Mr. Maxwell, but hope to do so later on. The fact remained, however, that cacao in at least one district had to be irrigated, and was being produced at a profit under irrigation; and discussing the matter afterwards with M. Leploe, he told us that in the Colombian case the land was flooded every fortnight or so, when, the soil being of a somewhat sandy nature, the excess of moisture soon drained off and passed through the ground. In Venezuela also, our esteemed Belgian colleague told us, irrigation was in force, in one case down a hill, when he believed small gullies were cut to guide the water, but that seemed doubtful. Sent broadcast over the land at the side of a hill a serious erosion of soil would ensue, but as it is important, both on the flat as well as on the hill land, to direct the water to the roots, we would certainly recommend, where the ground is hilly or even sloping, that the land some 4 ft. round the lower side of the tree should be loosened and banked up to catch and check the moisture and holes perhaps made on the upper side of the slopes to conduct the water down to the roots.

(To be continued.)

THE R.M.S. *Ebro* was launched at Belfast on September 8th by Messrs. Workman, Clark and Co., Ltd., for The Royal Mail Steam Packet Company. The *Ebro*, which is a twin-screw vessel, 467 ft. long by 58 ft. broad, with a gross tonnage of about 8,500, is destined for the West Indies, Colombia, Panama Canal, and New York mail and passenger service. She has numerous water-tight bulkheads, special fireproof divisions, and a complete cellular double bottom. There are state cabins with bath-rooms attached, and also a large number of single- and double-bedded rooms fitted with bedsteads instead of berths. A number of these rooms have communicating doors so that they can be engaged *en suite*, whilst the public rooms and state rooms occupy the midship portion of four decks, and are large airy apartments fitted with every modern convenience. The dining saloon, situated on the main deck, is a beautiful apartment decorated in the Italian Renaissance style, and has accommodation for nearly

200 persons at small tables arranged on the restaurant plan. Special attention has been given to the important matter of ventilation, and electric fans are provided throughout the accommodation.

Where Rubber is Used. No. 6.



No. 6.—First class saloon of T.S.S. *Paris*, laid with North British interlocking rubber tiling.

[Month by month we propose to include a photograph similar to the above, illustrative of the more modern uses of rubber, especially on a large scale.]

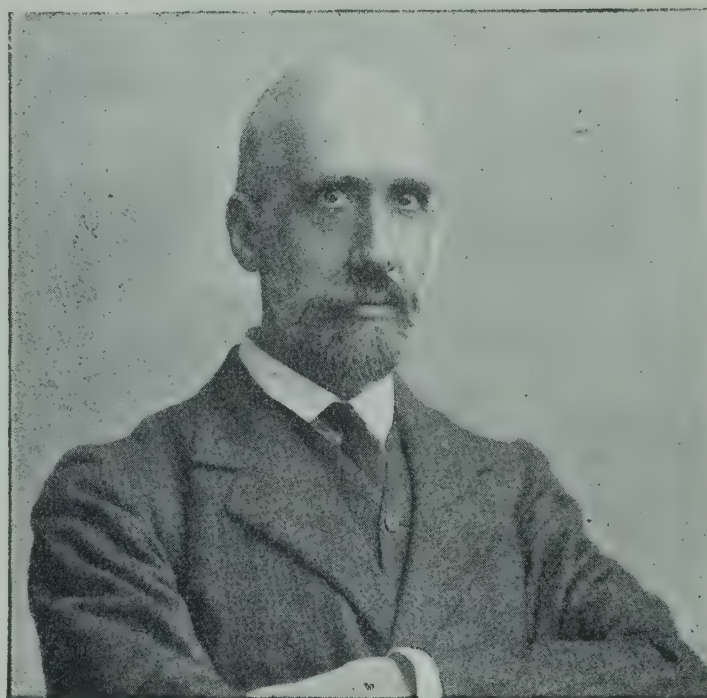
"It may interest you to know that we are making a drying machine for sisal, which will save an enormous amount of labour," write Messrs. Shirtliff Bros., of Hampton Hill, Middlesex. "Previously the leaves were put through a decorticator, then the fibre was taken outside by hand, in small bundles, washed by hand, hung up to dry, taken into the factory again by hand, then brushed; in all of this hand labour took a great

part before the fibre was ready for baling. The amount of labour, therefore, that is necessary is simply enormous, as you can imagine. Now in our new system or process all this hand labour totally disappears. The leaves go into the decorticator as before, but after that the fibre is not touched by hand until it is ready for baling. It is washed in the decorticator, goes straight from there automatically into the dryer, then automatically into and through the brusher, and is delivered alongside the press ready for baling, and all this without being handled once. Furthermore, we make the entire plant, so can guarantee every screw and bolt in it." Those who grumble at the low price of sisal compared to the cost of production, will no doubt be glad to hear of the above machine. Present quotations include Mexican sisal at 21s. c.i.f.

The Rubber Market.

VIEWS OF THE CHAIRMAN OF HARRISONS AND CROSFIELDS, LTD.

DISCUSSING the present position of the Rubber Market, at the sixth ordinary general meeting of Messrs. Harrisons and Crosfields, Mr. C. Heath Clark, the Chairman, told those present that it has been for some years "very difficult and risky to attempt to forecast the features of the rubber market in advance. This difficulty has been greatly caused by the large and rapid development of the industry during recent years on both sides, production and also consumption having alike advanced with gigantic strides. In the year 1900 the world's production was about 50,000 tons, and the consumption for the year was about the same. Last year the world's production of rubber amounted to 117,000 tons, and the consumption to slightly more than this amount. The difficulty of making a correct forecast of the market for rubber is rendered an almost impossible task under the war conditions ruling to-day. Two large countries, Germany and Austria, have been cut off from rubber supplies, and it remains to be seen how far the other European countries, together with America, will require and utilize the whole of the world's production. At present the signs are distinctly favourable. The stocks of rubber in this country, which at the end of July amounted to 5,543 tons, at the end of September had been reduced to 5,416 tons, against 5,859 tons in stock a year ago. Of the total quantity of plantation rubber landed during the present year, amounting to 30,801 tons for the nine months ending September 30th, 30,425 tons have been delivered, so that practically the total quantity landed has already gone into consumption. For the two months since the war began the average price has been well maintained, so that up to the present the demand has proved to be quite satisfactory. The losses consequent upon the war may possibly tend to reduce rubber consumption in some directions—such as that of motor-cars used for pleasure purposes—but what I think may prove to more than counterbalance any such shrinkage is the withdrawal for war purposes of such vast numbers of horses, whose part in the commercial life of the community and the work of the world will almost of necessity have to be supplied by motor vehicles, and it would appear quite possible that the needs arising from and out of the war may more than compensate for the losses in some other directions.



Mr. C. Heath Clark, J.P., Chairman of Messrs. Harrisons and Crosfields, Ltd., Secretaries and Agents for over thirty Rubber Companies.

" RUBBER PRICES AND SUPPLIES: REDUCED COSTS.

"The prices of rubber since our meeting a year ago, while continuing on a low level, have on the whole been maintained at a higher point than was then anticipated, and it is worthy of remark that the price of first-grade Plantation rubber was somewhat higher last month than it was a year ago. There is one feature which I referred to at our meeting a year ago, and which, I think, is of the greatest importance to those of us who are largely interested in the rubber industry in the Middle East—that is, the great reduction that is taking place in costs. That has gone on during the past year, and from the returns of ten companies taken at random I find that there has been during the past year an average saving of 6d. per lb. on the all-in costs. This reduction may be expected to continue, and possibly prove to be expedited by the necessity for very strict economy in the management of estates in consequence of the war and the stringent financial conditions prevailing at the present time.

For the same reasons production will probably prove to be checked. All unnecessary capital expenditure will cease for the time on the estates, and tapping will be avoided until the trees have reached an age and a yielding capacity to provide a satisfactory profit on the outlay. It is also very probable that the collection of wild rubber may continue to fall off to a very much greater extent owing to the difficulty of finance than would have been the case if it were a question alone of comparatively low prices.

"I might remark in this connection that I was looking at some figures this morning which show that the exports to this

country from sources other than the Middle East have been reduced for the nine months of the present year ending with September to the extent of nearly one-third. That probably is a fair indication of the effect which the low prices ruling have had on other sources of supply; and when to the low prices are added the difficulties of finance which will now have to be faced, I think there is very reasonable probability that we shall see a continued further decrease in the supplies from the other portions of the world that compete with us in the Middle East, and I think we may continue to feel confident that, whatever the temporary effects of the war may be on the rubber industry, it will continue to give us handsome returns on the large amount of capital invested in it."

"Farming with Dynamite."

As stated last month (p. 167), the news of the postponement of the Batavian Congress and Exhibition came too late to prevent our sending across the paper we had prepared for it bearing the above title; whether we shall get it back, or whether the papers received in Batavia will still be published we cannot yet say. As none of them will be any good a year hence, we hope that, as many papers must have been prepared, if not actually sent, the authorities may yet see their way to publish them. We have since heard that the Congress, if not the Exhibition, will take place after all, within about a month of the original date, but have had no official confirmation of this news.

Had we received the following notes by Mr. F. G. Spring, which we now reprint from the Federated Malay States *Bulletin*, we should have included them in the Batavian paper, but since they have only just come to hand, we must be content with publishing them in TROPICAL LIFE. Meanwhile, those who have of late been renewing their requests for copies of the paper we sent to the New York Congress in 1912, and which has so far only appeared in the *India-Rubber World*, of New York, or in journals that have reproduced it from there, will be glad to know that Mr. Manders has decided to reproduce the paper in *The Rubber Industry* for 1914, being the report of the (1914) London Rubber Congress, which is to make its appearance next month; those, therefore, who are interested in the matter may be glad to know of these two papers. Coming now to Mr. Spring's notes, these run as follows:—

"It may be remembered that in October of last year a demonstration, on the use of explosives as applied in rubber cultivation, was given at the Experimental Plantation, Kuala Lumpur, by Mr. MacQueen, representing Nobel's Explosives Company, Ltd., of Glasgow. The results in this article are those obtained from an area which Mr. MacQueen subjected to gelignite charges.

"The land on which the experiment was carried out is of a poor laterite nature, and the rubber very backward in growth, four-year-old trees measuring about 12 in. in girth, 3 ft. from the ground.

"Three rows of rubber, running the length of the field and each containing thirty-four trees, were selected, one row being the dynamite plot, while the other two acted as controls. The cartridges were placed at a depth of about 2½ ft. below the surface of the ground, one cartridge between two trees 12½ ft. apart. (Distance of planting 12½ ft. by 25 ft.) The method of firing was by means of fuses and detonators.

"It is unfortunate that this particular soil is not one which would be expected to give the best results, subsoils of a clay nature should respond better to the use of explosives. An experiment on a very much larger scale is being conducted at Castleton Estate, Teluk Anson, where the soil is of a heavier type. Below is a record of the figures in respect of the experiment conducted at Kuala Lumpur.

"Date of application of dynamite, October 24th, 1913:—

	Dynamite plot	Control No. 1	Control No. 2
Average girth measured 3 ft. from ground on October 30th, 1913	9.75 in.	9.5 in.	10.25 in.

	Dynamite plot	Control No. 1	Control No. 2
Average girth measured 3 ft. from ground on June 9th, 1914	12.31 in.	11.31 in.	11.87 in.
Average girth increase from October 30th, 1913, to June 9th, 1914	2.56 in.	1.81 in.	1.62 in.

"It will be seen that in the dynamite plot the average girth increase, over a period of seven months and a few days, amounts to 2.56 in., while in control No. 1 the increase is 1.81 in., and in No. 2 1.62 in. It might here be stated that control No. 1 is adjacent to the dynamite plot, while No. 2 is some distance away.

"I would not care to say definitely that the excess in girth increase over the control plots is due to the effect of dynamite, but as the area in which the experiment was conducted shows more or less uniform growth throughout, and bearing in mind that one of the controls had the largest average girth at the commencement, it would appear that the explosive had good effect even on this soil; whether it is profitable will depend on how long the beneficial effects last. It is intended to remeasure the trees in a few months' time.

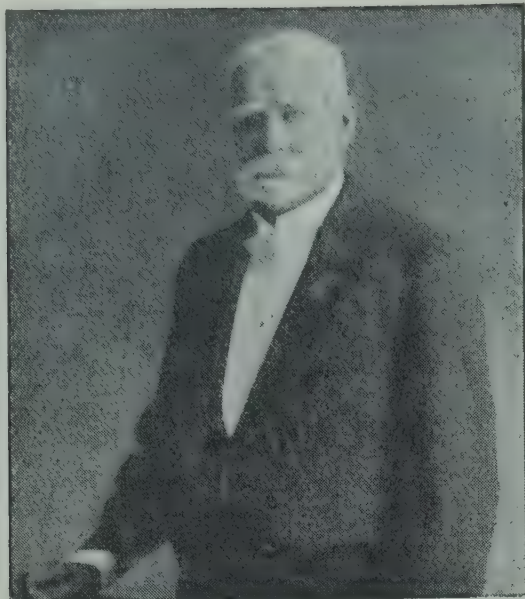
"With regard to the cost of application, 15 cents (100 cents = one Straits dollar of 2s. 4d.) per charge, inclusive of labour, would perhaps be a reasonable figure; one charge per tree is generally being allowed."

THE Annual Report of the Botanic Gardens at Singapore and Penang for 1913 has just come to hand, and as usual contains an interesting account of the work being carried on out there. General notes include one about Mr. J. C. Harvey, our friend at Sanbon, Mexico, who sent to the Gardens some *Dioon spinulosum*, *Nolina recurvata* (*Beaucarnea recurvata*), two *Amaryllids*, and some *Randia mussaenda*, all of which have turned out successes; also that the hybrid tobacco *Nicotiana sanderae*, flowered at Government House for, it is believed, the first time in Singapore.

Under the coco-nut trees preservation ordinance, 149 notices were served on 75 owners for the removal of such growth, &c., in which beetles were breeding. No cases were taken to court; but a sudden change in the management of a certain estate alone prevented one from being so terminated. The Palm Weevil has been unduly abundant during the year as a consequence of the cutting of young coco-nuts out of land interplanted with rubber or, in one case, for rubber, and also on account of the ignorance of owners that they must completely remove and destroy coco-nut trunks before the beetles have found a lodgment in them.

WHILST, owing to the war, supplies of acetic acid tend to run short on rubber estates, it is suggested, among other alternatives, that the latex be allowed to coagulate spontaneously with the help of smoke.

We are discussing at some length in our next issue the possibilities of making acetic acid from coco-nut milk, especially in Ceylon and Malaya, where both the rubber and the nuts abound. In view of the waste of this by-product the question is worthy of attention, and we feel certain it will be thoroughly investigated,



"Tropical Life" Friend.—No. 112.

MR. H. H. THIELE,

Secretary of The Planters' Association of Fiji.

THE Planters' Association of Fiji, it may be remembered, was inaugurated in September, 1902; before that the nucleus, so far as we can remember, was the Banana Shippers' Combination, which had been formed for the purpose of protecting the interests of the planters and shippers in connection with buyers as well as over steamship freights and Government legislation. The first Association President was Mr. S. L. Lazarus, whilst the last two, Mr. E. F. Powell and (now) Mr. J. L. Hunt, have each held that office for four years. There are branches of the Association at Nandi (established in 1908), and also at Ba, Rewa and Lambasa, where they started in 1911. In 1909 Mr. Jepson was appointed Government Entomologist, and has done excellent work ever since he arrived. *The Fiji Planters' Journal* made its first appearance in July last year, and to judge by the interest evinced in it by those who come to study the file at our office, as well as by the ever-increasing number of subscribers which we understand receive it in and around Fiji, it is much appreciated by those who read it, and this brings us into touch with "Our Friend." "It must be recorded," Mr. Hunt said in his Presidential Address, delivered before the members of the Association just a year ago (in September, 1913), "that there would have been no journal had it not been for Mr. Thiele, its able Editor and our Secretary." This being so, we are sure that there are many besides the members of the Association who are glad that "Our Friend" found himself in Fiji, and this is how he got there.

Born in Denmark in 1846, Mr. Thiele passed the first part of his early life in that country, but has practically been living in British Colonies or among English-speaking people ever since, even to fighting for us, as, after taking his degree at Copenhagen University, he took part as an officer of infantry in the war between Denmark and the combined forces of Germany and Austria in 1864, and later on served as a volunteer in the Colonial mounted force during the Maori War in New Zealand in 1867-68.

"Our Friend" gained his first knowledge of agriculture in one of the excellent model farms which

even then existed in Denmark, and afterwards extended his experience by working on estates first in New Zealand for about two years, and then in the Argentine for another couple of years, finally removing to Fiji, where he has now been for twenty-seven years, until to-day he finds it easier to write and talk in English than Danish. Besides agriculture, Mr. Thiele is interested in natural history, whilst he has always been a prominent Freemason out there in Fiji.

"Our Friend" is a great believer in the possibilities and future of the Fiji Islands, which he claims have a healthy climate, whilst there is plenty of land available for lease on reasonable terms, and comparatively speaking, a satisfactory supply of labour from India. In face of this, and considering how well those have done who have taken up lands, the wonder is that more planters have not found their way to Fiji; no doubt in the near future the islands will be better appreciated, especially as any economical plant which will grow in the Tropics will grow there, and the lands are not troubled with more than their share of pests, but rather less. It is true that the islands are liable to occasional hurricanes—about once in ten years—but Mr. Thiele insists that during his twenty-seven years' sojourn out there none of the outbreaks blew with the force that did those he experienced when in the West Indies. To encourage the planting up of the lands a scheme was suggested by the Government some months ago to train a few young men in agricultural pursuits on the experimental stations, principally with a view of supplying the large plantations with overseers having some experience, the pupils paying for their board and lodging. The proposition seems sound enough, but, from what we know of Fijian planters, they will prefer to personally teach the young men the cultivation of the special product they are interested in instead of letting him have a general training. It would be next to impossible for a man in the position of an ordinary overseer in Fiji to save sufficient money out of his wages wherewith to commence operations on his own account; some of them become managers and do better then. It is also questionable if a local man after having spent a year or two on the experimental station will remain and seek employment in Fiji, as his prospects there are not very tempting. Therefore, it might be a better arrangement to allow any intending settler arriving there with capital to go to one of the experimental stations for a year or so, pay for his board and lodging (say 30s. a week), take an actual part, as far as his health and strength permit, in the working of the place, and also learn the language of the labour usually employed, and to expect him to do and learn only what will be useful to him in the future. If such an arrangement was extensively advertised in the English papers it might attract some enterprising men to the Colony—men who, to commence with, would prefer living on a plantation and learning something useful to living in town waiting for something to turn up. By this we do not mean that the experimental station should be turned into a cheap country boarding-house, but that men trained there, as described above, and afterwards taking up land would have every prospect of success, and would be satisfied with their lot and with the Colony. We only hope that something can be done along the lines suggested by Mr. Thiele.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

OCTOBER, 1914.

Tropical Gardening.

In the same way as it is claimed that tropical birds have no souls since they have no song, so in most cases, whilst there is every inducement to have nice gardens to please the eye as well as nourish the body, tropical houses are usually found standing on the "bare ground" perfectly unadorned or else surrounded with bush and growth that medical science tells us to-day should not be allowed round habitations. Yet while the birds cannot help their defect, the owners of the houses can, and it would be better for everyone, planter, estate labourer and passer-by alike, if a taste for horticulture were developed, and flowers, fruits and vegetables, as well as the rearing of poultry, were made a feature, according to their means, by every white resident in the Tropics and sub-Tropics. If this were done it would soon be found that the example set would be followed by the native-born residents as well; in fact, in South America and the West Indies many of the Creoles have most beautiful gardens, the culture of roses especially being a great attraction, if only because of the difficulties to be encountered at the start or at all times under some circumstances.

Feeling this to be the case, we have noted with pleasure the increasing number of orders that we have been receiving of late for books on tropical gardening, and now that Mr. Macmillan has issued the second edition of his well-known work we hope to see the orders come in faster than ever.* We feel sure that

they will do so, as independent of our experience, Mr. Macmillan evidently finds matters to-day very much as we did ten and fifteen years ago, and he entirely shares our opinion as to the advantages of extending the practice of gardening throughout the Tropics, since he tells us that "it is being recognized, slowly but surely, that gardening plays an important part in home adornment and comfort; as well as in rural improvement and sanitation. . . . Superintendents of estates or plantations in lonely districts admit that the presence of choice flowering or foliage plants or trees about their bungalow have an exhilarating influence. . . . In rubber districts especially, the depressing effects of long interminable stretches of sombre-looking rubber trees are well known."

In face of the above we were glad to learn that the first edition of Mr. Macmillan's book was quickly exhausted, and to receive our copy of this the new and enlarged one. Looking through the work we carefully noted what the author has to tell us regarding the long list of manures that he discusses, especially regarding the utilization of night soil. "It has often been stated," he tells us (p. 25), "that there is no manure equal in fertilizing value to night soil which has been found to produce special richness of colour in flowers, and vigour and succulence in vegetables. . . . Its preparation, by adding gypsum, ashes, earth, sawdust, &c., is considered to cause it to form but a poor fertilizer." This poorness of quality would, we take it, depend on the quantity of absorbing mixture used. In many centres coco-nut fibre or coir dust could be used, although this has a considerable value just now in connection with the manufacture of explosives, and, as a fertilizer, we are told on p. 28, "coir dust is of but small value, though it has a beneficial mechanical effect on certain soils, especially such as are deficient in humus."

Where we believe that the uttermost good could be obtained from night soil, and that too without harm or unpleasantness to residents, would be to dry it *in vacuo*, as is done with fish offal and other offensive matter over here. If dried in a similar manner, all the fertilizing value of the material treated would be retained, whilst the weight to be transported and the objectionable feature of the mass will be reduced to a minimum.

Thinking of this reminds us that we are recommended to mix fish guano with soil and refuse, "so that its powerful fertilizing properties can be more evenly distributed," whilst with poudrette (*i.e.*, night soil mixed with gypsum, earth, &c., to facilitate transportation) the result is considered to form but a poor fertilizer. In both cases, however, we feel certain that important sanitary and economic advantages would accrue if large central stations were erected at which night-soil could be converted into a harmless but useful and even valuable manure on a large scale.

Coming to other matters, we hope that in the third edition Mr. Macmillan will devote more space to the use of explosives when planting and cultivating, instead of the half-page only with which he dismisses this useful adjunct to tropical agricultural methods in the book under review. For removing stumps previous to laying out and cultivating the garden, Mr. Macmillan, on p. 191, includes two illustrations of the Trehwella "Monkey Jack" at work to show how easily and completely it removes the stumps; the

* "A Handbook of Tropical Gardening and Planting," with special reference to Ceylon, by H. F. Macmillan, F.L.S., Superintendent Royal Botanic Gardens, Ceylon, 662 pp. + xxxv pp. index. Over 300 illustrations. Price 13s. 4d. Postage 1s. 6d. H. W. Cave and Co., Amen Corner, Colombo, and TROPICAL LIFE Publishing Department, London.

mowing of lawns either by animal traction or by hand is illustrated with machines of Messrs. Ransomes, Sims and Jefferies', Ltd., make, whilst our friends, the spraying machine manufacturers, will find ample reasons in the book as to why their implements should be freely and willingly bought, not only for exterminating pests, but also for watering and irrigating the plants as well. Our old friend, John Chinaman, will do well to try the advantage of a good-sized spray bucket or tank on wheels when having to water his lettuces, &c., instead of the small water-can that we all associate him with in a tropical vegetable garden. "The extent of the destruction to crops by various insect pests in different countries is incalculable," we are told on p. 612. "According to a recent return issued by the United States Agricultural Department, the direct and indirect yearly losses caused by insects in that country alone amount in the aggregate to over \$700,000,000 (£140,000,000 sterling). Of this amount the loss to tobacco crops is put down at \$5,000,000, to cotton \$30,000,000, and to apple crops \$20,000,000." The man, therefore, who claims that he cannot afford to buy spray machines is indeed penny wise and thousands of pounds foolish; anyone who says spraying is no use . . . but there, we do not write for the inmates of lunatic asylums.

The illustrated section devoted to a descriptive list of many hundreds of flowering and ornamental plants, extends to p. 439, and exceeds any trade catalogue we know in the data given. Chapter XIX tells us about plants suitable for dry regions, sea coasts and sandy situations, whilst Chapter XX describes shade trees in a manner worthy of careful study. Economic plants are as fully dealt with as one could expect in Section 4, p. 469 *et seq.*, beginning with Chapter XXII, which takes the important crops, as cacao, coco-nuts, rice, rubber, tea, tobacco, &c., whilst the following chapter tells us about the minor products, as areca and betel nuts, camphor, bark, coca, coffee, &c., and, later on, we come to drugs (p. 532), fibres (with a full list on pp. 550-552), fodder and medicinal plants, &c., whilst the book closes with notes on the transport and storing of seeds, recipes for preparing foods from tropical fruits and vegetables, and useful references *re* measuring trees and timber, costs per acre, weights and measures, and so on, and starts with instructions on budding and pruning, and information about Mendl's (the Abbé Gregor Mendl) Law. All sorts and conditions of men, therefore, planters or otherwise, who believe in making life in the Tropics healthy and attractive as it can be made with a little knowledge and trouble, will welcome this second and enlarged edition of Mr. Macmillan's* already well-known and popular "Handbook on Tropical Gardening and Planting."

"The Settlers' Guide to Greater Britain," by Gordon and Noel Brown (Simpkin, Marshall, London), costs only 2s. 6d. net (weighs 36 oz.) and contains many coloured maps, and 424 pages crowded with information regarding the agriculture and commerce of our overseas possessions, including the Tropics and their crops.

* It will be remembered that this gentleman's portrait adorned our issue of March last, p. 850, when he figured as "Our Friend," just after we had had the pleasure of discussing the above book with him when he was in London.

Rubber and Coco-nut Planting in Malaya.

ADVANCE copies of the statistics prepared by Mr. L. Lewton-Brain, Director of Agriculture, Federated Malay States, for incorporation in his Departmental Report for 1913, recently came to hand. They give the latest authentic statistics of rubber and coco-nut planting in the Malay Peninsula, together with other interesting figures bearing upon the agricultural industry of the country.

Concurrently with an expansion of the areas under rubber and coco-nut there is a decline in coffee and sugar planting. In fact, sugar, once the chief agricultural product of Province Wellesley, appears to have practically gone out of cultivation, for there were only seven acres under it in the Straits Settlements against 300 acres in the Federated Malay States, and 3,073 acres in the Straits Settlements in 1912. In the whole of Malaya last year there were only 8,775 acres under coffee (7,695 in the Federated Malay States), against 9,739 acres in 1912 (8,609 in the Federated Malay States).

The total area under cultivation on estates of a hundred acres and over in the Federated Malay States only, excluding padi and horticulture, amounted to 485,327 acres in 1913, against 441,182 acres in 1912. This was made up as follows:—

	1912	1913
Rubber	399,197	433,324
Coco-nuts	30,308	40,175
Coffee	8,609	7,695
Other cultivations	3,068	4,133

As regards rubber, whilst the following covers the whole of Malaya, only estates of 100 acres and over are included:—

	1912	1913
Estates	1,055	1,151
Acreage in possession	1,498,282	1,622,231
Acreage planted... ..	621,621	708,545
Rubber alone	587,874	682,613
Rubber interplanted with catch-crops	33,748	25,932
Acreage producing	165,566	213,459
Planted during year	85,903	86,924
Output (in tons)	18,956 8 cwt.	28,169 16 cwt.

The area under rubber in acres in the various portions of the Peninsula is as follows:—

	1912	1913
Federated Malay States	399,197	433,324
Straits Settlements	94,263	111,316
Johore	91,827	117,022
Kelantan and Kedah	34,837	45,373
Trengganu	1,497	1,510
Total	621,621	708,545

The area under coco-nuts in the whole of Malaya was 83,841 acres on estates of over 100 acres, small cultivators, of whom there are many, not being taken into these statistics. The total is made up as follows:—

	1912	1913
Federated Malay States... ..	30,308	40,175
Straits Settlements	25,398	23,394
Johore	684	895
Kelantan and Kedah	13,234	14,986
Trengganu... ..	3,843	4,391
Total	73,467	83,841

The Federated Malay States, with an output of 21,229.17 tons, rank first in importance, whilst the

output of the Straits Settlements amounted to 6,047.14 tons; Johore, 1,645.7 tons; and Kelantan and Kedah, 246.18 tons. Trengganu is not yet a producer.

Coming now to the ever-vexed question of labour, the total number of labourers employed on the estates amounted to 282,354, compared with 255,912 in 1912. Of these, no less than 201,207 were employed in the Federated Malay States. The statistics of the various races are given in the following comparative table:—

	1912	1913
Tamil men	107,875	114,680
Tamil women	37,973	48,052
Javanese men	17,593	18,250
Javanese women	5,987	6,320
Malays	19,426	17,373
Chinese	63,210	75,141
Others	3,848	2,538
Total	255,912	282,354

Review.

PRACTICAL TROPICAL SANITATION. By W. Alex. Muirhead. 288 pp., 114 illustrations and diagrams. Price 10s. 6d. net. (Weights 29 oz.) John Murray, 50A, Albemarle Street, London, W.

Remembering the days when we occupied the position of municipal councillor in a thriving tropical town, we have digested this book with pleasure tinged with regret that we did not have it with us twenty years ago. What an oracle we should have felt ourselves to have been in those days had we then known all the book under review has to teach us. It has been written, we take it, on the text offered by the 1912 Report of the Tropical Diseases Board of the Philippines, which tells us (p. 18) that "the more rapid the eradication of the idea that the tropical climate, *per se*, injuriously affects the nervous system, the more rapid will be the decrease of such mild forms of neurasthenia and irritability as are due largely to a preconceived dread of the effects of tropical residence."

We are glad to see on p. 115 that the use of spraying apparatus for disinfecting the air in and around houses is recommended. We certainly believe in this, especially as some of the fluids used have a cooling effect on the air.

In the chapter on ventilation mention is made and an illustration included of the Blackman fan, but not of the Blackman intermittent fan discussed in our September issue of last year, which seems to us to offer several advantages over the old type of propeller fan shown in the book (p. 134). We say this because this new make of fan, in place of the usual continuous or sweeping draughts, creates breezes which gently rise and fall in the most natural manner possible. The air is thus able to come and go at intervals which can be changed at will and can be made to blow in one direction intermittently, or in both directions alternately, and this latter movement has the effect of a punkah. Sir Ronald Ross, as quoted on p. 261, in his "Sanitary Instructions for the Tropics," urges all Europeans to use punkahs, hand-fans, or fans driven by hot-air engines or electricity. These, he rightly claims, keep off insects,

add to comfort and prevent much of the debility produced by long-continued heat. Those therefore interested in drying and ventilating tropical rooms and buildings, whilst carefully noting everything Mr. Muirhead has to tell us throughout the book, should in all cases make inquiries for the latest makes of the various apparatuses in which they are interested, whether fans, spraying machines, filters, &c., that have recently been introduced, so as to be certain of using the most suitable for the work to be done. In the chapter dealing with water supply, prominence is given to the Berkefeld filter and its system, *i.e.*, bougie or candle form, which is described as the best for domestic use. We agree with this and believe that the other makes on this candle filter system are all based on the Berkefeld make, which is fully illustrated and the system explained, *viz.*: These filtering cylinders or candles are completely closed at one end, and the other end is fitted into a metal mount. The water passes through the walls from outside to the inside, leaving all the impurities on the external surface, and then out through the small aperture of the mount. For dealing with relatively large quantities of water, multiple filters, *i.e.*, batteries of candles, are used.

We should like to have discussed with the author, who is a staff-sergeant of the R.A.M.C., and is now an assistant instructor at the School of Army Sanitation, Aldershot, what his opinion is on the use of cork boards (properly treated with preservatives and insecticides to prevent rotting) for tropical buildings as recommended in our book on "Soil and Plant Sanitation" (pp. 523-529)* to keep out the heat and so render the interiors of the houses cooler.

The section on slaughter-houses, when and which animals should not be killed, and how to detect disease, &c., in dead meat, cannot be too carefully studied; the prevention of plague, the management of disinfecting houses, are equally important; whilst the notes on buildings and building materials are practical and useful. Incinerators and destructors are discussed fully, and we trust that many more of these most necessary appliances are now in use than was the case when we had "a say in the matter." Recollections are disagreeably impressed on our memory on account of the outrageous offence to sight and scent such a disgusting method for the disposal of night-soil and garbage, in the Tropics of all places occasioned to those passing even at a distance. On p. 191 we suggest how such a nuisance can be turned to an advantage and profit.

In Chapter VI on "Disinfection," attention is called to the "Thresh" system, and an illustration included showing the "Thresh" Current Steam Disinfecter at work. Messrs. Summerscales, Ltd., the makers, have kindly promised to supply us with further particulars of this machine, which is especially suitable they claim, for the Tropics, being guaranteed simple and "fool-proof" in all ways.

* Where we say (p. 523): "Planters, if they are wise, will turn their attention to the question of cork insulation not only for private residences and offices, but also for estate buildings, particularly rubber-dairies or factories where a low, even temperature is desired." The next six or seven pages are devoted to explaining how this can be done, the cork preserved, &c.

Where Food Supplies Fail in the Tropics.

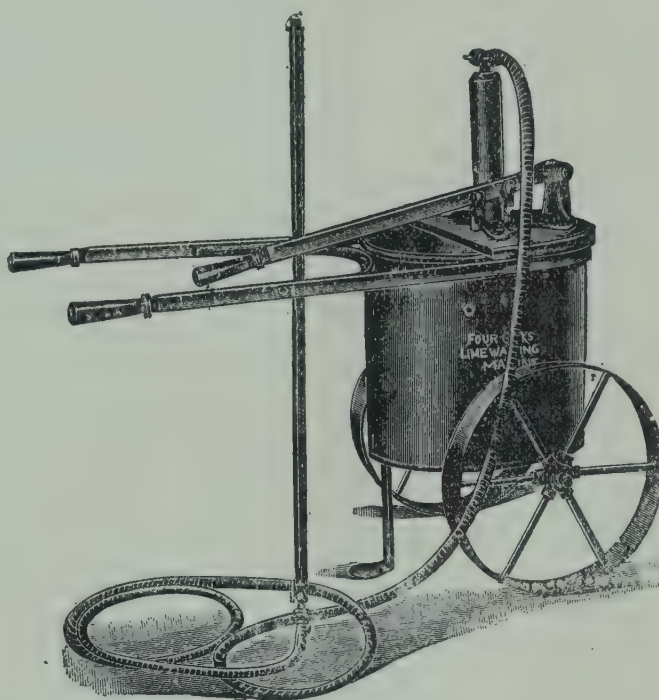
EVIDENTLY this country is not the only one suffering from an over-proportion of parasitic trades and traders and an insufficiency of producers, as, according to the *Mindanao Herald*, the Philippines are in the same state, since our contemporary tells us that: "This archipelago has placed itself in a state of double dependence upon the outside world in that it must sell copra, hemp, tobacco, sugar, &c., to foreign markets and look to those markets for food in exchange. Disturbance of peace conditions has interrupted this trade. Our neighbours can survive without our copra, hemp, tobacco and sugar, but the rice and other food-stuffs which the Philippines have received monthly are vital to our welfare. Three or four months of active planting of corn, potatoes, beans and other quick-growing crops can change all this. Philippine welfare demands prompt action in correction of this economic anomaly, and its correction should prove an industrial revolution which will be of incalculable permanent benefit to the Philippines. Under present conditions many localities in the Philippines so depend upon the outside world for food that a month without imports causes hunger. The Philippines should be exporters of staple foods, and if its inhabitants are smart this foreign war can be converted into a local benefit rather than a calamity." The *Herald* urges everyone to co-operate with Governor Carpenter, who is bringing official influence to bear upon agriculturists to plant quick-growing food crops in abundance. "Incidentally, a percentage of those now engaged in petty mercantile lines should be diverted to productive occupations. There are too many middlemen intervening between producers and consumers. Their function is now a parasitic one."

In these days of huge manufacturing trades, one is not surprised at the United Kingdom not producing sufficient foodstuffs to feed her ever-increasing family, but when you come to the Philippine Isles, which are not yet entirely covered with bricks and mortar, one would have fancied that far from having to import anything in the shape of food, except luxuries, they would have had enough and to spare to export elsewhere. One lives and learns, however, that that which should be is not always so.

MESSRS. KEGAN PAUL, TRENCH, TRUBNER AND CO., LTD. (68-74, Carter Lane, London, E.C.), have added another book to their list of the Trübner Language

Manuals edited by Mr. Y. H. Freese, M.A., viz., "A Malay Manual," with grammar, reading exercises and vocabularies. This, a handy-sized book in a neat, stiff-brown cloth cover, costs only 2s. net, and runs into 114 pages. We are told in the preface that it has been adapted from or built up on the leading works on the language, although an independent compilation. We cannot say that the contents lead us to believe that it is an easy task to learn to read and write Malay, but since many have in the past become proficient in it, so can others in the future, and that in spite of our being told "anyone aiming at a thorough knowledge of the language, literature and history of the Malay people should commence the task by learning Dutch." Why this should be so is not quite clear to us, for although the birthplace of the language may be Sumatra, it seems to us, so far as the words in the manual are concerned, to owe very little to the Dutch language and a great deal to Arabic, and after that to Sanskrit. The Malay national literature, we are told, still uses the Arabic written signs, a knowledge of which is indispensable to the student who aims at a more thorough insight into the spirit of the language. Hence, it will be necessary to devote some attention to the Arabic alphabet. As a start to acquire a knowledge of this interesting but somewhat complicated language and literature, this handy little two-shilling book will be difficult to beat.

For the War. No. 3.



The above illustrates a Spraying, Limewashing, Disinfecting and Painting Machine supplied to the War Office by the Four Oaks Spraying Machine Company, Four Oaks Works, Sutton Coldfield, Birmingham, for painting purposes. The same machine has been supplied to the Admiralty. It is the Four Oaks "Bridgwater" pattern and secured the TROPICAL LIFE Gold Medal at the International Rubber Exhibition, London, 1914.

Numbers of the same pattern have been supplied to Coffee Plantations.

attended the International Congress for Applied Chemistry in New York two years ago, has done extraordinarily useful work during his lifelong work in connection with the sugar industry both as untiring investigator and adviser and also as editor of the *Austrian-Hungarian Sugar Industry Journal*. Two years ago Dr. Strohmer celebrated the twenty-fifth anniversary of his directorship, at which occasion the most genuine token of esteem and veneration were bestowed on him by sugar men from every part of the globe."

MR. A. BAUR, the well-known proprietor of the Ceylon Manure Works, and a citizen of Geneva, has presented 10,000 lb. of Ceylon tea to the Swiss Army, which has been mobilized to guard the frontiers.

"In these unhappy days," writes Mr. Prinsen-Geerligs, the Dutch sugar expert and most kind-hearted of men, in his letter to the *Louisiana Planter*, "we were startled by the sad news of the death of the Councillor Dr. Friedrich Strohmer, Director of the Vienna Sugar Experimental Station. Dr. Strohmer, who, by the way,

The London Produce Markets.

FINANCE AND INDUSTRY.

THE following was published on October 2nd as a comparison of the principal points at that time and in the corresponding week of last year as regards the Bank of England:—

	Present	Last Year
Bank Bullion	£52,916,604	£37,597,823
Reserve of Notes	35,793,260	24,853,455
Private Securities	116,819,799	28,200,855
Notes in Circulation	34,974,625	29,635,445
Rate of Discount	5 per cent.	5 per cent.
Price of 2½ per cent. Consols	68½	73¾
Price of Bar Silver	24d.	28¾
By October 10th the total reserve had increased to £40,378,212.		

The condition of the produce markets was described on October 2nd as having undergone no material alteration. A state of suspended animation will doubtless continue until something fairly decisive happens between the contending armies in France. A fair trade demand has, however, been manifest in various directions, but prices have shown more or less irregularity, although with considerable advances in many instances.

Speaking of the Wool Sales the *Daily Telegraph's* special correspondent said that "There is no gain-saying the fact that the short series of sales which finished Saturday, October 10th, have given much satisfaction to all branches of the trade, notwithstanding that merinos have made a sensible decline compared with last July rates. Still, when one considers the conditions which have been created on account of the war, it is remarkable that the fall has not been double. The fact alone proclaims the resourcefulness of the textile manufacturer of Great Britain, and for home trade spinners and manufacturers to lift 50,000 bales of wool in five days without prices suffering is indeed a most commendable feat. In fact, cross-breds have advanced anywhere from 15 to 20 per cent. compared with July sales, this being an echo of the unparalleled boom which at present obtains in all manufacturing circles throughout Great Britain. When one takes these facts into consideration, it will be admitted that there is cause for satisfaction over the recent series of sales. Very few Continental buyers have been in attendance."

As regards the rubber share market, Messrs. Zorn and Leigh-Hunt wrote as follows on September 30th, and since then had not issued another report up to the time of writing:—

"It is exactly nine weeks since we last issued a report on the Rubber Share Market. This does not mean that the market has ceased to exist during the interval, for a certain number of transactions have taken place for cash almost daily, but it is only in the last few weeks that conditions have become sufficiently normal to re-establish anything like genuine dealing prices in the leading shares. It is now possible to give fairly reliable quotations in a good many instances, and we propose to issue a report again from time to time in the hope that it may prove of interest to clients. Rubber shareholders certainly appear likely to come off much better than many other investors, so far as the intrinsic value of their holdings is concerned. No industry has presented a firmer front in face of the gigantic upheaval caused by the war; and trade reports show that manufacturers are full up with

orders, both from military and civil quarters. It is not surprising, therefore, that the demand for plantation rubber is satisfactory, while the price shows a substantial advance, even since the war broke out. It certainly looks as though the average price for the year 1914 will not work out at less than 2s. 3d. per lb. (the average to date is 2s. 3¼d.), and as "all in" costs of production are now in many cases down to the neighbourhood of 1s., the companies which are producing in quantity are likely to show very satisfactory results, war or no war."

Coming now to produce market news generally we have gathered together the following particulars:—

Coco-nut Products, &c.

Messrs. Goodlake and Nutter report that the market still kept very firm for Ceylon coco-nut oil, and freight was difficult to obtain from the East to London. Afloat oil we quote 45s. 3d. to 44s. 3d., according to position of steamer. There are sellers at 42s. for October-November and 41s. 6d. October-December, with buyers about 10s. per ton less money. There is a fair demand for white oil and for October-November we quote 43s. and December-January 42s. 6d. c.i.f. London. Cochin Oil: There is a little more inquiry for near positions. October-November there are sellers at 44s. 6d. and October-December we quote 43s. 6d. Palm Kernel Oil: There has been a large business done for prompt and October f.a.s. Liverpool at 46s. full terms in casks. Pressed Oil: There is a very good demand on the spot and 40s. 3d. has been paid without any commission and there would be further buyers thereat. For November-December, however, there are sellers at 39s. 10½d. full terms in Ceylon casks f.a.s. London. Spot Prices: Ceylon £48 to £50, Cochin £56 to £58.

General reports from the *Public Ledger* and elsewhere at that time (October 10th) quoted:—

Copra quiet and lower. For shipment to London: Ceylon October-November steamer £23 2s. 6d. sellers, Malabar October-November £23 17s. 6d. paid, F.M.S. Singapore September-October £22 15s. sellers, October-November £22 10s. and South Sea September-October £22 value. To Marseilles: Federated Malay Straits September-October £22 10s. sellers, October-November £22 7s. 6d. sellers. Manila September-October £22 10s. sellers and October-December £22 5s. paid. To Holland: Java October-December £25 value c.f. and i.

Coco-nut oil firm. Ceylon spot £45 to £48, afloat £45 c.i.f., September-November £42 c.i.f., October-December £41 10s. c.i.f. Cochin spot £55, afloat £48 10s. c.i.f., September-November £44 10s. c.i.f. London pressed November-December £39 10s.

Later we hear that copra is dull and unchanged. For shipment to London: Ceylon October-November steamer £23 2s. 6d. sellers, Malabar October-November £23 17s. 6d. paid, F.M.S. Singapore September-October £22 15s. sellers, October-November £22 10s. and South Sea September-October £22 value. To Marseilles: Federated Malay Straits September-October £22 10s. sellers, October-November £22 7s. 6d. sellers. Manila September-October £22 10s. sellers and October-December £22 5s. paid. To Holland: Java October-December £25 value c.i. and f.

Letters in from Fiji, dated September 11th, stated that prices locally had dropped from £16 to £8 a ton on account of the war. Ceylon copra fell to Rs. 44 to 45 per candy (560 lb.), but recovered to Rs. 62, against Rs. 107, the record price, obtained in August last year. Readers of TROPICAL LIFE should compare the price of copra in London to-day with August, 1913, and then see whether such an immense drop is justified. If the Home Government is preventing the retail price of sugar from running up it should also see that the price of copra does not become unduly low, as the retail price of margarine here could be cheaper, and that, by increasing consumption, would help the coconut planters at producing centres.

Of course, there is the great difficulty of freight, it being, we are told, impossible to secure any to London, and so prices here, especially for oil, tend upwards. At the same time, we want to encourage the consumption of coco-nut margarine all we can, so trust efforts will be made here to ensure the public obtaining their supplies at as low a price as possible.

Coco-nut Oil: Ceylon spot £45 to £48, afloat £45 c.i.f., September-November £42 c.i.f., October-December £41 10s. c.i.f. Cochin spot £55, afloat £48 10s. c.i.f., September-November £44 10s. c.i.f. London pressed November-December £39 10s.

Soya Bean Oil: Oriental in cases spot London £25 10s.

Liverpool tells us that Lagos Palm Oil, owing to continued light supplies, is again exceptionally dearer, whilst other descriptions show little or no change from last week. Trading has been on a moderate basis, and amounts to about 850 tons, including spot Hards £26 7s. 6d. Benin £27 10s., and Softs £29, with Benin afloat £27 10s., all transit, and Benin spot £27 per ton, quay.

As regards oilcakes, all descriptions of linseed and decorticated and undecorticated cotton-seed cakes at Liverpool are held for recent currencies, with a moderate inquiry going on for imported, and there is a continued fair demand experienced for local brands. 5,551 bags Palm Nut Cake sold from store, but the price has not been reported.

Cotton.

No market reports have come to hand as yet for this article. Odd fragments of news tell us that both American and East Indian kinds have been quiet, but that quotations are unaltered. The *Times*, speaking of the Liverpool market of October 10th, told us that the spot market has been dull, consumers buying only for actual needs owing partly to the monetary stringency ruling. Spinners continue to pay some attention, however, to new crop cotton shortly due to arrive, owing to its very low prices. With consumers taking delivery of a fair amount of cotton previously contracted for, and with smaller arrivals, stocks show a further decrease on the week of 28,930 bales. Holders of American met a moderate inquiry at previous prices. Brazilian and East Indian were in poor request but unchanged. Egyptian were pressed for sale and declined twenty points. The quantity of cotton sold and price fixed amounted to only 700 bales American, and that sold on call to 1,800 American and 300 sundries. Import 3,614 bales

American. The feeling regarding the resumption of business in the future's market is more hopeful, especially should an equitable settlement be arrived at in connection with the liquidation of the extensive straddle interest between this market and New York. There was no allotment for futures delivery contracts yesterday. It has been announced that the next settlement of differences is to take place on Thursday, the 15th inst., on the basis of 5.25d. for American, January-February, and 7.85d. for Egyptian, January delivery. With cotton accumulating rapidly in the interior, pressure to sell continues and planters offer freely at a fair decline. The crop movements are increasing but slowly, the quantity brought into sight during the past week amounting to 323,000 bales, making 1,205,000 since August 1st, compared with 2,790,000 bales in the corresponding period of 1913.

No business was reported at that time from New York, but we hear that the weather has been favourable throughout the cotton belt in the States, though prospects were then pointing to more unsettled weather.

The *Public Ledger*, in their weekly summary on October 10th, included the following quotations:—

Cotton :	1914				1913			
	Per lb.				Per lb.			
	s.	d.		s.	d.	s.	d.	
Surat : Broach ...	0	5 ³ / ₈	to	0	5 ¹ / ₁₆	0	6 ¹ / ₂	to 0 6 ¹ / ₁₆
Sawginned Dharwar...	0	4 ² / ₃	„	0	5	0	6 ³ / ₂	„ 0 6 ³ / ₈
Madras : Tinnevely ...	0	5 ¹ / ₂	„	0	5 ³ / ₄	0	6 ³ / ₄	„ 0 7
Western ...	0	5	„	0	0	0	6 ¹ / ₄	„ 0 0
Coconada ...	0	4 ⁷ / ₈	„	0	5	0	6	„ 0 6 ¹ / ₁₆
Salem ...	0	5 ³ / ₈	„	0	0	0	6 ⁵ / ₈	„ 0 0
Bengal ...	0	3 ⁷ / ₈	„	0	4 ¹ / ₄	0	5 ⁵ / ₈	„ 0 6
Scinde ...	0	4	„	0	4 ¹ / ₄	0	5 ³ / ₄	„ 0 6
Australian ...	0	0	„	0	0	0	0	„ 0 0
Tahiti and Fiji ...	0	0	„	0	0	0	0	„ 0 0
American Sea Island ...	0	9 ¹ / ₂	„	1	5	1	0 ¹ / ₂	„ 1 10
West India ...	0	7	„	0	8 ¹ / ₂	0	7	„ 0 8 ¹ / ₂

Coffee.

This market generally continues to be somewhat irregular, but, on the whole, unchanged; the visible supply stands at 10,024,000 bags against 10,482,000 last month and 12,181,000 on October 1st last year. The Rio Exchange continues to be a disturbing element, and subject to fluctuations, on October 10th it closed at 11¹/₂d. Future business has been small, the sales, we understand, registered by the London Produce Clearing House for the week ending October 10th being nil. The public auctions held during that week met with scarcely any demand, the market generally being dull. About 4,700 packages were offered on October 7th, and perhaps one-third sold at and since the sales, including the following:—

Middling greyish Guatemala at 58s.; Dumont Sao Paulo, washed, bold, 57s. 6d.; extra bold, 60s. to 60s. 6d.

Costa Rica.—Greyish, 63s. to 68s. 6d.; good, 70s. to 72s. 6d.; mixed, 55s. to 59s.; small, 51s. per cwt.

Mexican.—London cleaned bold size, 72s.; medium, 65s. 6d.; small, 52s.; Peaberry, 69s. 6d. per cwt.

Nicaragua.—London cleaned, bold size, 62s.; medium, 50s. 6d.; Triage, 30s.; Peaberry, 58s.; foxy palish, 52s. per cwt.

Vera Paz.—A few small lots sold at 61s. to 64s.; brownish, 52s. to 56s. per cwt.

Colombian.—Greyish and greenish, 66s. 6d. to 69s.; small, 55s. 6d. to 58s. 6d.; Triage, 42s. to 49s.; London cleaned, bold size, 75s.; medium, 67s.; Peaberry, 81s. per cwt.

Demerara.—Private sales at 62s. to 65s. per cwt.

Nairobi.—First size, 66s. to 70s.; medium, 60s.; smalls and Triage, 54s. to 59s.; Peaberry, 67s. to 68s. per cwt.

Mombasa.—Very brownish, 50s. to 55s.; Triage, 48s. per cwt.

Up at Liverpool there is a steady demand at prices showing but little change on the week, and valuations for Jamaicas are above last year, say:—

	1914		1913	
	per cwt. in bond		per cwt. in bond	
Jamaica, low to good ...	70s. 0d. to	80s. 0d.	65s. 0d. to	75s. 0d.
ordinary				
low to good mid. ...	85s. 0d. „	95s. 0d.	80s. 0d. „	95s. 0d.
fine mid. to fine ...	105s. 0d. „	130s. 0d.	100s. 0d. „	115s. 0d.
African, Enconge ...	43s. 0d. „	48s. 0d.	57s. 0d. „	60s. 0d.
do. Elephant berry...	58s. 0d. „	64s. 0d.	64s. 0d. „	70s. 0d.
St. Domingo ...	49s. 0d. „	53s. 0d.	58s. 0d. „	62s. 0d.
Central American ...	50s. 0d. „	73s. 0d.	60s. 0d. „	88s. 0d.
Rio. low to good ord. ...	43s. 0d. „	49s. 0d.	52s. 0d. „	58s. 0d.
Santos, fair to good ...	44s. 0d. „	50s. 0d.	54s. 0d. „	60s. 0d.
average				
Bahia, low to good ord.	43s. 0d. „	48s. 0d.	52s. 0d. „	57s. 0d.
Pernam and Ceara ...	48s. 0d. „	50s. 0d.	54s. 0d. „	56s. 0d.

The India-rubber Market.

No public sales have as yet taken place in London; we believe there was some movement to arrange some but they fell through. Up at Liverpool the Pará market was fairly active during the week ending October 10th, at about steady prices, the closing values being hard fine spot 2s. 10d., soft fine 2s. 5d., Peruvian ball 1s. 11d., and scrappy negroheads 1s. 9½d. per lb. Medium Brazilian grades continue idle. The African market has been firm during the week, but there has only been a retail business passing.

In London the market was firm for spot Pará, but weak for forward business. Judging from all one hears and sees around, the manufacturers must be extremely busy, so the demand, at any rate for the finer qualities, cannot surely go slack just yet. Of course, there is still great uncertainty as to what will happen until the final “knock-out” takes place, but whilst the usual home trade must suffer, we cannot believe that the demand generally will fall off in face of the clamourings on all sides for outfits of every kind, in which, of course, rubber enjoys a very full share. Meanwhile there has been a good demand for plantation kinds for America and Russia, resulting in good orders being placed at firm to dearer rates.

A firmer market has prevailed for Plantation on a good steady demand on the spot, reported the *Public Ledger* on October 10th, all grades of Crêpe participating, and considerable sales have been effected at better prices, but at the close there has been a rather weaker tone on some cessation of buying, and rates close slightly below the best. In the forward positions there has been a better inquiry and more business has been done. Standard No. 1 Crêpe on the spot sold up to 2s. 2d., but at the close 2s. 1½d. is the best price paid, with further sellers thereat. In specky darks and browns sales have been made at 1s. 4d.

to 1s. 10d., the latter for light brown. No. 1 Crêpe for October delivery sold at 2s. 1¾d. and sellers, November at 2s. 1¾d. and sellers, and December at 2s. 1¾d. to 2s. 1½d., closing sellers at 2s. 1¾d., January-March (1915) closing 2s. 0¾d. sellers. Smoked sheet (ribbed) on the spot sold at 2s. 2¾d. to 2s. 3½d., closing sellers of f.a.q. at 2s. 3d., October and November deliveries close 2s. 2½d. buyers.

The Pará market has been very firm for Hard Fine, although fluctuating and prices more or less nominal, closing on spot with rather buyers at 2s. 11d., October delivery closes 2s. 8½d. value, November 2s. 6½d. and December 2s. 5½d. Manco Hard at the close sold at 2s. 6d. and December delivery at 2s. 5½d.

Caucho Ball continues scarce and wanted. On the spot sales have been made up to 1s. 11½d., with 2s. reported to-day, closing sellers at 2s. 0½d. and buyers at 1s. 11½d.; forward delivery sold at 1s. 8d. to 1s. 9d.

Negroheads are very quiet. Manaos Scrappy quoted nominally 1s. 10d., Cametas 1s. 2d. and Island 1s. 1d.

The fall of Antwerp has, of course, done away with the market there entirely, whilst it must have been at a standstill for some time past, but we understand that two or three of the leading rubber dealers and merchants have transferred their business to London, whence no doubt their rubber has been coming for some time.

The rubber quotations issued by S. Figgis and Co. on October 16th included Standard Crêpe, 1st latex, 2s. 2d.; ditto, delivery, October, 1914, 2s. 1¾d.; ditto delivery, November-December, 2s. 1d. to 2s. 1¼d.; Standard Sheet, ribbed smoked, 2s. 3¼d. to 2s. 3½d.; ditto, delivery October, 1914, 2s. 3d.; ditto, delivery November-December, 2s. 2¼d. to 2s. 2½d.; ditto, unsmoked, spot, 2s. 1d. Market firmer, sales of spot Crêpe up to 2s. 2d.

Hard fine Pará, spot, 2s. 9½d.; ditto, forward October delivery, 2s. 8d.; soft fine spot, 2s. 3½d.; ditto, forward, November, 1s. 11d.; Negroheads, scrappy Manaos, 1s. 9d. to 1s. 9½d.; ditto, Cameta, 1s. 1½d.; ditto, Island, nominal, 1s.; Ball, Caucho Upriver, f.a.q. spot, 2s.; ditto, forward, 1s. 8½d. to 1s. 9d. Market quiet.

Sugar.

Under the headline of “Cheaper Sugar—£18,000,000 Purchase by the Government,” the *London Times* of October 9th told its readers that the Commission appointed by the Cabinet for the maintenance and regulation of the food supplies of the country during the war have made immense purchases of sugar for the benefit of the consuming public.

Sugar was the one commodity in which there was imminent danger of a famine, owing to the sudden stoppage of imports from Germany and Austria, the source of two-thirds of our supplies. Prices went up with a bound immediately after the declaration of war.

The Commission appointed by the Government, with Sir Henry Primrose as Chairman, were given full power to act, and, as they state in their report published a week ago, they arranged that the whole body of refiners should stand aside from the market for raw sugars, leaving it free for the operations of the Government. Acting upon the recommendations of

the Commission, the Food Supplies Committee, of which Mr. McKenna, the Home Secretary, is Chairman, have purchased over 900,000 tons of sugar, raw and refined. The price varied in different transactions, but in the aggregate it was about £20 per ton, and the total amount so far expended exceeds £18,000,000.

The raw sugar is being issued to the refiners at a price which, while protecting the Government from loss, will enable the refined product to be sold to the public by retail grocers at 3½d. per lb. for good granulated and 4½d. per lb. for good cubes.

We understand that the first consignment of these purchases by the Government has arrived in the shape of some 25,000 tons.

According to the London correspondent of Messrs. Willett and Gray, writing on September 4th, the following is an approximate estimate of purchases by the British Government:—

Javas	...	...	...	500,000 tons.
Cubans, old and new	...	...	...	250,000 „
Mauritius	...	...	...	100,000 „
West Indies	...	...	...	50,000 „

Total ... 900,000 tons.

We must reckon, the same authority goes on to say, that at least 100,000 tons will be brought in by trade purchases in England, so that about 1,000,000 tons are provided for the United Kingdom, which should be sufficient to last with reduced consumption for about ten months, say 100,000 tons against the ordinary consumption of 150,000 per month. This taken in conjunction with the stock which we had on August 1st, should be enough to last the country for twelve months. Of course, should the war collapse at an early date, there might be some easement in the position by the saving of part of the European beet crops, but this at the present juncture is a very doubtful contingency.

The English consumption per head is 90 to 91 lb., nearly two million tons (4,480,000,000 lb.) being imported into the British Isles last year, including 1,599,359 tons from the Continent (922,254 tons refined, and 677,105 tons raw sugar). Practically the whole of these sixteen hundred thousand tons will have to be replaced if the war lasts a year, and in any case one has still to sit up and wonder what Europe will do for sugar, even if the present beet crop is taken off and converted, when her supplies comes to an end.

Speaking generally, the *Public Ledger* tells us: A quiet tone has prevailed, and quotations in many cases are easier for spot parcels. For shipment there has been some pressure to sell, and to effect business lower prices have had to be accepted. Home Refined continues in good request, but refiners still find a difficulty in fulfilling orders. Foreign Refined on the spot has been quiet and quotations have ruled in favour of buyers. Crystallized has been slow of sale, and previous rates are not generally maintained.

The Board of Trade returns last month showed more pronounced movements incidental to the war. Imports into the United Kingdom totalled 83,182 tons, against 89,314 last year, and 91,348 tons in 1912. Cane sorts increased 62,807 tons, whilst beet declined 19,917 tons.

Actual sales include: Crystallized Demerara, fine yellow, 29s. Antigua Muscovado, good semi-grainy yellowish realized 23s. Mauritius syrups, good greyish white at 26s., good semi-grainy yellowish 25s. 6d. Crystallized Trinidad, good to fine yellow, sold at 28s. 6d. to 29s., and Mauritius fine yellow 29s.

In Liverpool: 2,060 bags Brazilian sold at 13s. 3d. telquel, ex quay, in bond.

White Java.—Shipped from Java sold at 21s. 6d. to 23s. 9d., according to position, and October 21s. 6d. to 21s. c.f. and i. London.

Foreign Refined closes with an easier tone. Cubes RT and WSR spot sold at 34s. 6d. to 34s., Granulated WSR. 32s. to 31s, and American 31s. to 30s.

American Granulated sold at 28s., shipping 25s. 6d.

Italian Granulated.—Shipped sold at 23s. c.f. and i. London.

The London Cocoa Market.

By THE EDITOR.

THE month since our last appearance has passed, and passed rapidly, due, I suppose, to one's mind being so thoroughly occupied at all times that we do not notice how quickly first the day and then the week goes by. Anxiety to secure news of what is going on or what is likely to happen in the near future in the forlorn hope that a gleam of light may be shed on the situation to guide holders of cocoa how to act, has become the dominant note of the day, a note too, we fear, that still strikes dumb to us all. All one can say is that the Government, or some one, continues to buy the better class of medium Trinidads, Grenadas, Jamaicas, &c., and also Guayaquils, and that whilst the market is quiet there is a steady demand at unchanged prices. London in this respect has certainly done better than Liverpool, which has apparently been badly held up since the war started, probably because she has not the class of cocoa in demand at the moment. London also being the centre of preparation for the war, and having the advantage of its public market, must naturally be the easiest to deal in; but, as we said before, if those having our own Colonial Gold Coast cocoa for sale improved the quality a little so as to bring a larger percentage within the pale of "fine," and were less determined to hide their light under a bushel when everyone else, having anything to sell, is beating the big drum to attract the attention of possible buyers, I cannot help feeling that the Gold Coast cocoa of superior quality would have done, in proportion, as well as good red Jamaica has been doing during August and September. The commonest grades, such as the Continent, and especially Hamburg, used to buy, are certainly cut adrift, but this being so the one or two producers on the Gold Coast who have in the past occasionally sent forth some really good bold red fermented should double their efforts to do so now and send the cocoa to London to be sold right under the nose of the Government and the leading export buyers. Competition nowhere is particularly brisk just now, but what flicker there is burns brighter in London than elsewhere. "Quite a few lots of cocoa, originally intended for Germany, have found a home

here, and we can only rejoice as we have no doubt that London will resume its former position of being the leading cocoa market," thus speak Messrs. Theo. Vasmer and Co. in an excellent article contributed by them to the West India Committee Circular of October 6th, and as they are a firm second to none as regards experience of the cocoa markets of the world, we have much pleasure in reproducing so eminent an opinion to support our own views on the subject.

Although I shall, as usual, conclude by quoting current values as nearly as one can give them, it may be interesting to also give details of actual sales reported. News just to hand as we go to press speaks of fine St. Lucias as having sold at 58s. If correct, this foretells a sharp rise for all such cocoa if of desirable quality and not small and hard through drought. Business done since the end of September to October 10th include 600 Trinidads, middling to good mid. red, 56s. to 58s.; fine marks, 60s.; 60 Grenadas, good red marks, 54s.; 100 San Thomé, 51s.; 500 Guayaquil, greyish to good reddish Caraquez, 55s. to 56s.; Balao, 55s.; Arriba, 62s. 6d.; afterwards 150 Trinidad fine red realized 60s., and Caraquez and Machala (Guayaquil) 55s. Up at Liverpool, the only sale I have heard of is some 190 Jamaicans at 48s. to 53s., so evidently this growth is proving a favourite up there as it has been doing in London. Again another batch of sales in London included mid. red Trinidad at 55s. again, fine marks up to 60s., fair common Grenadas at 51s., good marks up to 54s., Caracas at 70s., then Machala fetched 54s. to 55s., Manta 56s., and Summer Arriba 64s. and 65s., fair St. Lucia 51s., fine up to 55s., fine Trinidads up to 60s. and 62s. Finally, for the week ending October 10th, London, Summer Arriba sold at 61s. to 62s., and Machala and Caraquez 54s. During the week ending October 17th I also understand that San Thomé changed hands up to 53s., whilst in Liverpool, Accra kinds f.a.q. continue to be steadily quoted at 42s. to 44s., and Pará 47s. to 49s. Private sales (in London) included fine Trinidads at 60s. to 61s.; small and hard, 54s.; fine St. Lucia, 58s.; Guayaquils, 61s. to 62s. for Summer Arriba; 57s. late Arriba; 54s. to 55s. for Caraquez, and 54s. Machala.

No public sales were held in London for three consecutive weeks (September 22nd and 29th, and October 6th), and comparatively small sales took place on October 13th, the first series after this long break. Meanwhile, although stocks in London have jumped up somewhat, from 90,000 bags on September 12th to 92,664 bags on October 10th, as shown, this was largely due to nearly 8,000 Guayaquils and over 2,100 Bahias being landed during the week ending October 3rd, the more attractive growths showing reduced figures, except Trinidads. Here are the stocks:—

London Stock, Oct. 10th—	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads ...	12,370	12,681	7,394
Grenadas ...	6,466	4,516	2,275
Other W.I. ...	4,459	4,550	9,772
British W. Africa	9,068	7,780	4,849
Portuguese W. Africa	1,144	4,914	7,582
German W. Africa	1,452	3,336	8,034
Ceylon and Java ...	15,054	16,194	14,132
Guayaquil ...	25,140	19,173	39,758
Brazil and Bahia	4,721	3,276	3,250
Other Foreign ...	12,790	9,630	7,966
Totals ...	92,664	86,050	105,012

Havre Stock, Sept. 30th—	1914. Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Accra ...	74,433	64 to 68	44,628	77 to 80
Bahia ...	16,036	63 ,, 75	4,887	78 ,, 85
Venezuela ...	93,100	70 ,, 200	57,353	85 ,, 200
Grenada and B.W.I.	1,699	—	2,196	—
Guayaquil...	51,159	70 ,, 78	15,359	80 ,, 86
Haiti ...	16,222	55 ,, 70	4,063	70 ,, 78
Pará ...	18,571	64 ,, 72	11,347	80 ,, 86
San Domingo ...	2,407	63 ,, 67	8,840	75 ,, 81
Trinidad ...	42,528	66 ,, 71	22,641	85 ,, 90
San Thomé ...	4,735	71 ,, 72	3,536	84 ,, 88
Divers ...	12,172	—	13,125	—
Totals ...	333,062 bags		187,975 bags	

As the stock shown last month, on August 15th, stood at 351,529 bags, it will be seen that during the following six weeks ending September 30th the deliveries had exceeded the receipts by 18,000 bags, this is better than having a further increase to that extent. Coming now to the Board of Trade figures, we find that the deliveries for Home Consumption to the end of September did not approach to last year's total for the month as August did; during September only 2,070 tons were delivered for H.C. against 2,431 last year and 2,537 tons in 1912. As can be seen in the following tables, it is in the foreign manufactured that a truly remarkable falling off is shown; one almost wonders if the figures are correct:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Sept. 30th) Tons.
Jan.-Sept., 1912—	24,981	20,259	4,579	9,506
" 1913—	27,603	20,504	5,178	10,674
" 1914—	31,711	21,321	4,752	15,363
Incr. 4,108	Incr. 817	Decr. 426	Incr. 4,689	
Foreign Manufactured—	Sept. only Landed.	Del'd H.C.	Jan.—Sept. Landed.	Del'd H.C.
1914 ...	847	760	7,751	7,635 tons
1913 ...	1,609	1,356	9,266	8,585 ,,
1912 ...	1,078	1,095	7,058	7,224 ,,

Now a word as to prices, first at the producing centres, and then at the consuming centres. Taken as a whole, prices for various reasons, possibly difficulty of transport, smallness of bean, increased cost of freight and insurance, are, judging by the quotations sent across by the last mails, unduly depressed at producing centres. This was especially the case with Trinidads, for whilst the Havre figures are quoted unchanged compared to mid-August (Fcs. 66 to 71), the nominal quotations from the Island itself would make you think that America as well as Europe was at war, and that Trinidad, instead of being bare of supplies and only anxious to see these come in much sooner than the lack of moisture will render possible, was weighed down with huge stocks that no one would take. To talk of \$9 or even \$10, as did the mails arriving during September, sounds ridiculous with London buying quietly but steadily up to 60s. and even 62s., as I show in the detailed transactions given above, and Trinidad is not the only centre affected in this way, although I hope it is an extreme case. Talking of the West Indies, our best thanks are due to Grenada and Trinidad for the splendid gifts they sent us towards the fund being raised to soften the privations of war. Grenada sent £10,000, of which £6,000 was to be expended on buying cocoa, and Trinidad £40,000, all to be expended on cocoa, whilst our other Colonies have been equally generous with their gifts of sugar, now so valuable and necessary.

Sales have been irregular, but prices realized for what sold have, on the whole, remained steady. It must be remembered, however, that it is not all kinds of cocoa that have been or can be sold. Jamaicas throughout have been a general favourite and sold as well and perhaps better than other growths. Trinidads also sold regularly, and so have the few Grenadas that were here, but this growth is scarce. With the Trinidads the Government has been buying Guayaquil, some 3,500 bags having been sold (I do not say all to the Government) during ten days or a fortnight. The movements of raw cocoa for the week ending October 10th (leaving us with a stock of 92,664 bags, as shown further back) were comparatively heavy so far as deliveries were concerned, especially the exports, being 3,881 bags delivered for home consumption, and 2,841 for export, making 6,722 bags in all, against 2,182 landed, thereby reducing the stock over 4,500 bags. Coming now to prices, these on October 17th were as follows; by the way, they include the public sales held on October 13th, the first held since September 15th:—

Trinidads.—Good red to fine, 60s. to 62s.; middling to good red, 57s. to 59s.; low middling, 55s. to 56s.

Grenadas.—Fine marks up to 55s.; good red, 53s. to 54s.; common unfermented to good fair fermented, 50s. to 52s. 6d.

Jamaicas.—Good red marks, 53s. to 54s.; fine up to 58s. 6d.; low unfermented to fair, 49s. to 51s.

St. Lucia.—Fine up to 54s.; low unfermented down to 47s.

Montserrat.—Fine sold at 70s.

Dominicas.—Good red up to 53s., common unfermented down to 47s.

British West African.—Judging from the Liverpool reports, have not been selling freely. If carefully fermented and prepared to compete against San Thomé, Bahia or Grenada, this growth ought to do well, especially being an English Colony, but common quality grades, such as Hamburg was satisfied to take, are not in demand so much just now. Some 700 bags good fermented recently sold at 51s. to 52s. This compared with Grenadas at 52s. to 53s. for good fair to good red, is not to be grumbled at.

Bahia.—Fair, which seems rather plentiful, has been sold at 48s., but superior, which is scarce, has been sold at 60s., with the idea that this price will go up rather than down.

San Thomé.—Has been selling at 51s. and 53s.

Caracas.—Common to fair realized 65s. to 70s., but anything worthy of the name should go from 90s. to over 100s.

Guayaquils.—Good summer Arriba has been selling at 62s. 6d. to 65s.; Balao, 55s. to 56s. 6d.; Caraquez, 54s. to 56s. 6d. Machala, if sold, should realize the same as Caraquez.

Ceylon.—Has not been selling with alacrity. Apparently it is not a Government cocoa, and the demand is quiet. Just over 1,000 bags were offered on October 13th, but were bought in. Fair medium to fine bold are worth 60s. to 75s., but what they will realize in an actual sale remains to be seen.

Later sales include fine Grenada at 57s. and fine St. Lucia at 58s.; prices for this type therefore must be placed on that basis.

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Tropical Advertising during the War.

A LEADING RUBBER ENGINEER DOUBLES HIS ORDER FOR SPACE.

It will be remembered that our August issue commenced with our appeal to "engineers, manufacturers and traders generally, not to pull back on account of the war, but to press forward more vigorously than ever . . . to make hay whilst the sun shines in the Tropics, if not here." This appeal was written on the second day after war had been declared between England and Germany, when the banks were "bank-holidaying," and Londoners somewhat glum. Knowing, however, that London is not the only place in the world, we reminded our readers of this fact, and that our overseas friends must be kept going, and in spite of being considered over optimistic at the time we launched our appeal, the results of which exceeded even our expectations, as those who have studied our last three issues all agree. It has remained, however, for Messrs. Iddons Bros., Ltd., the well-known rubber machinery engineers, of Leyland, and a somewhat recent recruit to our ranks, to go "one better." Having had a taste of our leadership in the Trade War, this firm, without being asked to increase their space, unexpectedly wrote to us to "please cancel our half-page advertisement and substitute instead one full page. We enclose herewith matter and block for the next two months, November and December." This shows that those who follow TROPICAL LIFE's lead are not only pleased with the results but wish to make more and more use of our services as time goes on. Where, of course, TROPICAL LIFE scores over papers devoted to a single industry as rubber, tea, sugar, &c., is in the fact that, come what may, at least one of our leading lines is always uppermost, and this means that there is always a number of our readers who have plenty of money to spend on machinery and estate supplies.

Now it is sugar that is doing especially well and selling at more than double the price it was realizing before the war. Think what this means for the (nearly) 10,000,000 tons of cane sugar alone, turned out last crop, or for the one to come. Cuba alone made over 2,500,000 tons (Chapara Estate 87,000 tons), so that those advertising with us get into touch with the financiers, merchants, and planters interested in sugar production as well as the other crops. Since this rise in price must put at least another £100,000,000 to £125,000,000 into the pockets of sugar-producers, their custom alone, whether for machinery, estate supplies, factory or household requirements is certainly worth whole securing, and so those firms who advertise with us are naturally pleased with the results.

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The War.

AMERICA LOOKS FOR A SPEEDY CLOSING DOWN.

THE placid manner in which Messrs. Brunner, Mond and Co., in London, asked the public to subscribe to and take up 450,000 5 per cent. first cumulative preference shares in William Gossage and Sons, Ltd., the well-known concern manufacturing soap, glycerine, &c., is in marked contrast to the feverish and, we believe, unsuccessful efforts of the German Empire to raise a loan a little time back; but then, whilst one is tottering to its fall, thanks to the ricocheting of their own big guns that broke down Rheims, Louvain, and other cathedrals, and the barbarities of their methods generally, the soap-making and margarine industries over here are going strong, and will become, at any rate as regards the making of margarine, one of the biggest industries of the world. If the motor threatens to improve the horse off the surface of the earth, the coco-nut and other oils certainly threaten to dispense with cows' milk for butter-making; whether soya-bean milk will ever cause the stuffed skin of a cow to stand up next to the hansom cab in a certain London museum as a curiosity of a past age still remains, however, to be proved by future events.

According to the American correspondent of the London *Daily Telegraph*, American experts, basing their views upon a detailed survey of the war from the start to now, conclude generally that the Allies must not only win, but, in all probability, will win much earlier than most people think. At first the German casualty lists were published in full, now they are so tremendous they can be printed only in abridged form, and as the lists are published a month after the period covered, the worst is yet to come.

Meanwhile it is as well to remember that long after the guns are silenced large numbers of fresh troops will be needed for months to come to replace those worn out by fighting, and to ensure our getting our terms respected and carried out faithfully until the last penny is paid. A greater show of firmness and strength will probably be needed then than now, but fortunately we have the reserve forces to fall back on, and no slacking will be allowed on the part of those who have still to enlist "because everything goes well," thanks to those who have done their duty.

The Batavian Rubber Exhibition and Congress.

NOVEMBER at last brought us definite news from Java respecting the International Rubber Congress, but whether the Exhibition as well can be included is not quite clear. Writing from Buitenzorg, on September 25th (letter received by us on November 2nd), Dr. A. A. L. Rutgers, Under-Secretary to the Congress Committee, acknowledges receipt of our paper on "Farming with Dynamite," and then adds, "The Committee is very glad indeed to add your valuable contribution to the list of papers published by the Congress, which, I suppose, you are aware has been deferred until October 19th." By this we feel therefore that the Congress, and probably the Exhibi-

tion, or at least what could be gathered together of it, duly took place last month.

We were glad to get this news, for it will enable us to drive home to the Dutch East Indies and others the advantage of using British-made explosives, as before the war our Dutch friends were drawing their supplies from German sources, although the British makes are preferable. This is especially so when they are made by a firm like our old friends, Messrs. Nobel, of Glasgow, who are, even to-day, in a particularly good position to supply all the explosives needed for agricultural purposes in the Tropics, as well as elsewhere, and "all the explosives needed" means, thanks to the way planters and farmers have taken to "Farming with Dynamite," a huge quantity.

THE Secretary of the International Dry-Farming Congress at Wichita, U.S.A., wrote on October 26th regretting, as we did, our absence from that important meeting, and then he goes on to say, "Your paper will be included in the proceedings and special mention has been made of it. This book of the Congress will be issued at a comparatively early date."

IF you want to know how to tone bromides green, how much flashlight powder to use, how to intensify colour plates, how to get warm tones on gaslight paper, about factorial development, about photography at night, about speeds of bromide papers, about exposures for interiors, about sepia or blue toning, about staining prints, or about the hundred and one other things connected with photography, refer to the Wellcome Photographic Exposure Record and Diary, which not only gives this information, &c., which every photographer needs, but also supplies answers as to exposure, development, &c., which are frequently asked by photographers the world over. It is a veritable encyclopædia of photography, condensing as it does into one pocket-sized volume, clear, simple directions for every process, information, general and particular, figures, tables, factors for all purposes and pages for exposure record, diary and memoranda. Here all the wrinkles and dodges—"tricks of the trade"—which have been culled by experiments and long experience, are analysed and set forth in simple formulæ and precise directions which not only help the beginner, saving him much time, trouble and material, but also serve as a useful reminder to the expert photographer. Independent exposure factors are given for all British and American plates and films. Fixed inside the back cover is the "Wellcome" Exposure Calculator, the ingenious device which, by one turn of one scale, gives the correct exposure for any plate or film at any time of day or year. By its use the percentage of spoiled plates is immediately reduced; it enables the beginner to "hit the mark every time." As before, three editions of the "Wellcome" Photographic Exposure Record and Diary are published, one for the Northern Hemisphere, one for the Southern Hemisphere, and the third, a special edition, for the United States of America, any of which may be obtained from all leading photographic dealers and booksellers. Price in the British Isles, one shilling.

Tobacco Planting.—No. X.

THE EFFECT OF CLIMATE ON TOBACCO.

In their "Handbook of Tobacco Culture," issued by the Department of Agriculture, Southern Rhodesia, the authors give some useful details concerning the effects of climate on tobacco leaf (see p. 5) which should be carefully noted.

"In general," it is claimed, "tropical climates will produce aromatic tobaccos, which are the best for cigar fillers, and the cooler portions of the temperate climate will produce thin leaves with but little aroma which are adapted for cigar wrappers." Sumatra wrappers are, of course, an exception in this latter class, for Sumatra itself is decidedly tropical, and on p. 11 the Rhodesian handbook also tells us that "the standard of excellence for wrappers is the Sumatra leaf, as the standard of quality in fillers is the Vuelta Abajo leaf."

"If tobacco is intended for cigar wrappers," Mr. Scherffius, the Ceylon expert, tells us "the leaf must have style and be elastic, thin in texture, finely grained, light and uniform in colour, and the stem and veins be small and of the same colour as the leaf, which should be as free from flavour as possible, it being the portion that comes in contact with the mouth." Mr. Scherffius also states that "the standard of excellence for wrappers is the Sumatra leaf." As regards colour and texture the percentage of water in the soil affects these characteristics to a very important degree. As with coco-nuts and all crops, the value of a soil, but especially of a tobacco soil, should be based rather on its ability to hold greater or less proportions of moisture, and to draw it up to the plants from below, especially if the rainfall or surface supply runs short; at the same time it must allow any surplus supply to drain off rapidly. Again, it is necessary to remember that the water not only affects the plant whilst in the ground, but by "its sufficient presence in the leaves when being cured, permits the development and action of the oxidizing enzymes, and of the different chemical changes that take place."

Coming back to the Rhodesian handbook, which every tobacco planter should possess, if copies are available, "while the tendency for the leaf is to become thick in warm climates, this tendency may be overcome by other conditions—as excessive rainfall. This is the condition in Sumatra, where the leaf is famous for its fineness of texture." On the other hand, except for wrapper tobacco, which, as stated above, "should be as free from flavour as possible," excessive rainfalls are a drawback, since they wash out the fine aroma which it is so important to retain. To avoid this, we understand that in Cuba they do not plant the tobacco until the heavy rains are over. Since a certain amount of water is necessary for the plant to ferment properly when being cured, very dry weather adversely affects the leaves, as it prevents the formation of enzymes, and for this reason tobacco grown in too dry an atmosphere is not likely to develop a fine aroma. "Proximity to the sea has a great influence on the quality of the product, causing it to be poor in combustibility, as the chlorine in the sea air is supposed to affect it, although in Sumatra good tobacco is grown within ten miles of

the coast, and that island, we are told, produces better tobacco on low, well-drained lands some distance from the sea, than is produced further inland on the mountain slopes." "Florida Cuban leaf," Mr. W. B. Wilson tells us in the *South African Agricultural Journal*, "produces a very valuable wrapper, usually a little thicker and more aromatic than the Sumatra leaf; the advantage of Cuban and Sumatran leaves are that they wrap many more cigars per lb. of tobacco used."

Quoting Scherffius again, we are told that the colour of the soil in some measure is indicative of its possibilities as a tobacco producer, light-coloured soils producing, generally, bright-coloured tobaccos, and dark soil a dark-coloured leaf. The finest tobacco in the world, from the standpoint of aroma, we are told elsewhere, is grown in the mountain valleys of western Cuba at a moderate altitude. "The climate of Rhodesia is generally well suited to the growing of bright tobacco," says the Rhodesian handbook, "although the rainfall of recent years has been irregular, and has sometimes adversely affected the quality and yield of the crop. Rhodesian leaf takes longer than the American product to grow and to ripen, for which the cool nights are mainly responsible. With a more or less uncertain rainfall, the question of irrigation is engaging the attention of a number of tobacco growers. Holding the opinion that tobacco will mature better with the natural rainfall, we would not go so far as to advocate growing the crop entirely under irrigation, but irrigation would undoubtedly be of great advantage in getting the plants started before the rains arrive, and rapidly grown and ripened before the hot weather is over, thus ensuring the best quality."* In Sumatra the cost price of tobacco sent to the European market is estimated at 80 cents to 1 florin (1s. 4d. to 1s. 8d.) per lb. What the cost is in Rhodesia we do not know, but the 1909-10 crop, offered for sale in Salisbury, amounting to 100,000 lb., sold up to 2s. 4½d. lb., whilst the 500,000 lb. gathered in the 1910-11 crop realized as high as 4s 6d. lb. for some lots, the average price working out at 1s. 2¾d. lb. for Virginian, and 2s. 1½d. for Turkish.†

THE Hawaii Agricultural Experiment Station has issued *Bulletin* No. 34, entitled, "Tobacco Insects in Hawaii," by their entomologist, Mr. D. T. Fullaway. It carries nine illustrations, runs into twenty pages, and is intended to supplement the information contained in the previous *Bulletin* (No. 10, by Mr. D. L. Van Dine), and deals with the principal pests—as cutworm, splitworm, pod-borer, hornworm, flea-beetle, and the cigarette beetle, all destructive. Copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., for 5 cts. a copy, postage extra, probably 1 ct.

* It is interesting to note *re* our Colonial tobaccos that the Imperial Institute has been in communication with Lord Kitchener with reference to the composition of the tobacco supplied by the War Office to the troops, and that he has now so far modified the War Office specification as to allow the use of tobacco of satisfactory quality grown in the British Colonies and Protectorates. In recent years several of the British Colonies have been growing excellent tobacco of the American type, especially Nyasaland and Rhodesia, and more recently Canada.

† *Tropical Agriculturist*, March, 1913, p. 117.

The Demand for Remounts and Beef Cattle.

"TIMID ONE" writes to know why we are so keen on advocating the breeding of cattle and pigs, if possible, on coco-nut estates. To this we replied because we believe it will pay since the supply of these animals is falling away whilst the demand for their meat is increasing. In the U.S.A. alone, we understand that last year (1913) the number of beef cattle fell by over $1\frac{3}{4}$ million (1,762,000) head, equal to 5 per cent. of the whole, and of hogs 4,082,000 head, or 7 per cent. Unless it is that the demand for wool keeps up the number of sheep, this also would fall away, but in that case sheep do not do in the Tropics. We have eaten mutton in Venezuela reared on approved lines and it tasted more like goat or venison. We quite enjoyed the meals, but did not recognize the meat, and the first time we had some our host sat up waiting to see if we noticed anything, and then told us practically no genuine novice realizes that they are eating mutton. To breed cattle and hogs on coco-nut estates to full advantage they must be given a certain area of open savannah, but besides this they would undoubtedly have hundreds and even thousands of acres under the palms over which they could roam without harm and browse at their leisure and to the owner's profit, any young trees that have to be put in to replace vacancies being fenced off until out of their reach. Besides this, of course, there is the poonac, if oil is made locally, and soon the very large estates will probably be shipping only the oil or selling the nuts to local mills, taking back the poonac for cattle feed or manure.

According to the daily papers, not only is the increased cost of living brought about by the war troubling the ordinary American, but the increased price now being asked and secured for horses suitable for remounts is causing anxiety in Army circles. "The price for horses suitable for war service," telegraphed Reuter from Washington at the end of October, "has advanced \$20 (£4) since the outbreak of hostilities in Europe, and that of young horses not yet trained \$17 (£3 8s.). The effect of the war has also been seen in an advance in the prices of foodstuffs. A dispatch from Chicago says that range cattle, which are usually cheaper than those fattened on grain, sold yesterday as high as \$157 (£31 8s.) per head. This constitutes a record."

Turning now to Ceylon, we learn that Major Loch has been very busy securing remounts for the Indian troops since his arrival in Colombo from India. He has, he told a representative of the *Times of Ceylon* recently, secured sixty horses in Colombo, and he hopes to get another sixty horses from the planting districts, which he is visiting.

"I will take all the horses I can get," said Major Loch. "They must be suitable for cavalry and artillery purposes—height 14.1 to 16 hands, 5 to 12 years." Major Loch is paying according to quality from Rs. 400 to Rs. 800. The horses are for the Indian troops going to the front, and though there are a good many already in India, there is an unlimited demand for remounts. Major Loch may also have to visit Australia, from whence, we believe, these Ceylon

"walers" come, and he wants to get back as soon as possible. We hope, in face of all these proofs of the need of increasing our supply of remounts as well as the world's output of meat, and also other foodstuffs, that those of our readers with grazing lands available will see to it that they go in for cattle raising and breeding remounts for the Army wherever possible.

This reminds us that we read in the July issue of *United Empire* (the Royal Colonial Institute organ) that the lease of 65,120 acres of grazing land in Alberta to the National Livestock Exchange of Montreal, for the purpose of raising cavalry mounts for the Canadian Government and the British War Office, has been ratified. The land in question is to be used by this company for the breeding of cavalry remounts from thoroughbred sires or mares to the number of not less than 1,500 a year, after 1916. The Canadian Government is to have first right of purchase at a maximum price of £50 per horse, and the British War Office is to have pre-emption rights (*i.e.*, the right to purchase) on the animals which remain. The land, it is reported, is leased at 1d. per acre, or a total of £270 per annum.

The same contemporary tells us that it is announced that the Agricultural College demonstration trains, to leave Winnipeg about the middle of June, will be run over both the Canadian Pacific and the Canadian Northern Railway lines. The trains are being equipped by the staff of the Manitoba Agricultural College, and the programme for this year will be unique, as it is being prepared specially on behalf of young men and women. The older members of the community will be invited to attend, but the lectures and demonstrations will specially appeal to the younger people who are anxious to improve their knowledge. An interesting feature will be the cinematograph films, showing the germination of seeds, growing of plants, the raising of poultry, bee-keeping, and the development of farm machinery. What a splendid idea; how useful it could be to stock-raisers, farmers and planters elsewhere, if extended in many directions, especially when Agricultural Colleges are erected and working in Ceylon and Trinidad.

According to the *Canada West-India Magazine*, whose praiseworthy efforts to increase the trade between Canada and the West Indies seem meeting with striking success, Bermuda promises to become a big meat-packing centre since, our contemporary tells us that: "Strong hopes are being held that a large meat-packing industry can be established in the Island. The idea is to have Bermuda made a 'half-way' house as it were for the cattle which are now being brought to the United States from Argentina, the slaughtering to be done in the Colony, the meat afterwards being exported in dressed form. A strongly backed scheme is now being formulated to establish the industry, while legislation to facilitate the import and export of cattle and beef has already been passed by the House of Assembly. Considering the enormous growth in the business of importing cattle from South America to the United States, the new project should mean much to Bermuda."

Books Received.

Books received include three very useful ones, viz.: "Tobacco Leaf; its Culture, Cure, Marketing and Manufacture," by Killebrew and Herbert Meyrick. 506 pp., over 170 illustrations. 11s. 6d. post free (TROPICAL LIFE Publishing Department).

"Cocoa," by Dr. C. J. J. van Hall, formerly connected with the Witch-broom disease investigations in Surinam, but now Director of the Institute for Plant Diseases and Cultures at Buitenzorg, Java, with a map and 140 illustrations. 515 pp. Price 14s. net (weight nearly 48 oz.), or 15s. 6d., post free. Macmillan and Co., Ltd., St. Martin's Street, London, Bombay, Calcutta, Melbourne. The Macmillan Co., New York, Boston, Chicago and San Francisco, U.S.A., and Toronto, Canada.

"The Coco-nut," by Edwin Bingham Copeland, Professor of Plant Pathology and Dean of the College of Agriculture, Philippine Isles. 212 pp., 23 illustrations (weight 24 oz.). Price 10s. net, or 10s. 8d. post free. Macmillan and Co., Ltd., as above.

The above are all standard works, and will be welcomed by everyone interested in the industries which they so ably discuss. Unfortunately they came to hand too late for us to do more than acknowledge in this number, but we shall be reviewing them, and constantly referring to them in subsequent issues.

THE third quarterly number of Vol. XII (1914) of the "Bulletin of the Imperial Institute," recently published (price 2s. 6d., or 11s. per annum post free, Mr. John Murray, Albemarle Street, W.), contains the results of recent investigations conducted by the scientific and technical staff of the Institute, including reports on economic products from the Zanzibar Protectorate, wheat from the Sudan, peas and beans from Burma, timbers from various countries, Pará rubber from the Gold Coast and Sierra Leone, Funtumia rubber from the Gold Coast, and Ceará from Papua.

A special article on the "Agricultural Resources of the Zanzibar Protectorate," by F. C. McClellan, Director of Agriculture, Zanzibar, describes the climate and system of land tenure in this portion of the Empire, discusses questions of labour and wages, and deals fully with crops and produce, the chief of which

are coco-nuts and cloves; elsewhere in this issue (p. 204) we deal fully with the data given *re* the cultivation and preparation of cloves.

In connection with the campaign for the capture of German trade, an article on the trade in palm kernels is of importance as showing that a large proportion of the exports of these kernels from West Africa are, or rather were, shipped to Germany, where they are used as the source of palm kernel oil and of cake for feeding livestock, whilst much of the oil is re-shipped to this country, making it only too apparent that this important trade and industry could quite well be carried on in this country.

Other articles deal with the utilization of waste fish as a source of manure; the tin resources of Australia, South Africa, and Nigeria; and the trade and industries of Seychelles; whilst the opening address to the Third International Congress of Tropical Agriculture (London, June, 1914), by the President,

Professor Wyndham R. Dunstan, C.M.G., LL.D., F.R.S., is printed *in extenso*, and his remarks *re* agricultural education in the Tropics and suggestion that a British Institute of Tropical Agriculture (see p. 211) should be formed in this country on lines similar to the Institutions of Civil, Mechanical and Electrical Engineers, the Institute of Chemistry, &c., will, we hope, be carefully studied and then acted upon at an early date.

Where Rubber is Used. No. 7.



No. 7.—Smoke-room on the s.s. Mongonui, with interlocking rubber tiling made by the North British Rubber Co., Ltd., Edinburgh.

It has been found necessary to issue a third and enlarged edition of "The Pocket Guide to the West Indies," by A. E. Aspinall. (With twenty-two maps and plans and many illustrations. Price 5s. net, post free 5s. 6d. Duckworth and Co., London, or the West India Committee, 15, Seething Lane, E.C.) We are glad to know of this both on account of the author and also because it shows that the public are being increasingly attracted to these Islands. First published in 1907, a new and revised edition was issued in 1910, reprinted in 1912, and now a third and more up-to-date book has appeared, as stated, and contains, in addition to all the information given in the previous editions, particulars of the Bahamas, the Bermudas, and especially of Panama and the Canal zone. The West Indies are fortunate in having such a trumpeter, for though good wine needs no bush, it needs a sign-post to tell you where to find it, and this Mr. Aspinall's Guide does to perfection; any spot you wish to visit is described in a way that is quite irresistible.

Surplus Copra Stocks.

WHAT SHALL WE DO WITH THEM?

ACCORDING to the Technical Information Bureau of the Imperial Institute, the imports of copra into Hamburg and Austria-Hungary during 1913 were as follows, and as Hamburg is the chief centre of the German oil-seed crushing industry, it is probable that the shipments of copra to that port practically represent the total German imports.

IMPORTS OF COPRA IN 1913 TO HAMBURG AND AUSTRIA-HUNGARY.

	Quantity metric tons (2,204 lb.)
<i>Hamburg—</i>	
Imports from all sources	230,395
„ „ British possessions	124,434
<i>Austria-Hungary—</i>	
Imports from all sources	33,604
„ „ British possessions	29,177

Meanwhile the quantity of British copra for which a new market must be found is about 153,611 metric tons, and although it seems likely that a considerable proportion of this can be taken by the United Kingdom, oil engineers and others may find more inclination on the part of producers and shippers to express the oil locally instead of shipping the copra, and so should look out for orders for machinery from the other side.

In addition to the possibility of finding a market in the United Kingdom, there appears to be a considerable chance of the British Possessions securing a share of the French import trade in copra. In 1912 the total imports of copra into France were 153,506 metric tons. Of this total 19,691 metric tons came from our own British Possessions, and 10,321 from French Colonies. Of the remainder 43,422 metric tons came from the Dutch East Indies and about 72,964 from the Philippines. It ought to be possible for Ceylon, India and the Federated Malay States to compete on favourable terms with the Dutch East Indies and the Philippines for this trade. There also seem to be considerable possibilities of developing an export trade in copra with Denmark, Scandinavia and Russia, and possibly with Holland.

In the case of the United States the imports of copra in 1913 amounted to 15,548 metric tons, of which 10,674 metric tons came from the Philippines and the rest mainly from French, British and German Possessions in the Pacific. The imports of coco-nut oil to the United States amounted in 1913 to 22,915 metric tons, of which about 18,000 metric tons came from Ceylon, India, the United Kingdom, and Australia, and the rest chiefly from France, Germany, and the Philippines. If these figures are correct we should imagine that the demand for coco-nut products in the States was capable, to put it mildly, of considerable development.

WE are glad to see that the use of disc-harrows is increasing in the Tropics, and where not actually in use efforts are being made to show the advantages of these useful implements, whilst willingness is shown by the native proprietors to attend the demonstrations arranged as when several planters attended the meeting to see the disc-harrow at work on the Experimental Station at Gangaruwa, Peradeniya, on September 3rd.

Maize v. Wheat.

CONSIDERABLE discussion has arisen at times over the comparative food and money values of maize, wheat, and other cereals, so in face of the present anxiety to make supplies go round and to see that every one, black or white, has a sufficiency, we have pleasure in reproducing the following tables from an article in the London *Economist*, Professor Burt-Davy's book, and also from the *Indian Trade Journal* of Calcutta, from whose columns the following and other useful particulars are reproduced (see their issue of August 13, pp. 258-259).

Wheat is slightly richer than maize in protein, while the latter contains a somewhat greater proportion of carbohydrates than wheat. Maize is also richer than rice in protein and fat, but contains a much smaller quantity of starch. A comparison of maize with wheat, rye, rice, barley, and oats in regard to digestible matter yields the following results:—

TOTAL DIGESTIBLE MATTER IN 100 LB. OF SEVERAL CEREALS.

	Protein	Carbohydrates	Fat	Total
Wheat ...	10.0	69.2	1.7	81.0
Maize ...	7.9	66.7	4.3	78.9
Rye ...	9.9	67.6	1.1	78.6
Rice ...	4.8	72.2	0.3	77.3
Barley ...	8.7	65.6	1.6	75.9
Oats ...	9.2	47.3	4.2	60.7

The following comparison of the food value of "Johnny Cake"—i.e., maize meal bread—and of wheat bread is from analysis by Atwater and Wood:—

	Wheat Bread	"Johnny Cake"
Water ...	40.0	38.0
Protein ...	6.5	8.5
Fat ...	1.0	2.7
Carbohydrates ...	51.2	47.3
Cellulose ...	.3	—
Ash ...	1.0	3.5
Total ...	100.0	100.0

The "Johnny Cake" is drier by 2 per cent., and contains 2 per cent. more protein (although of the two, wheat, as already stated, is slightly richer than maize in protein), $1\frac{3}{4}$ per cent. more fat, and less starch than wheat bread.

The immense importance which maize has achieved not only as a food for cattle, but also for human consumption, sums up the *Economist*, rests largely, as has been shown, upon its cheapness relatively to other foodstuffs. For, as we have seen, maize is slightly inferior to other cereals in protein, although its fattening qualities are superior, and, therefore, wheat would undoubtedly be preferred for many purposes were the cost not greater than the cost of maize. The following table shows the relative prices of maize, wheat, and oats in the United Kingdom during recent years:—

Weight for weight, maize is considerably cheaper than wheat or barley, while in the United Kingdom it is somewhat more expensive than oats. Like other cereals, however, maize has risen greatly in price during the last ten years; the causes of this rise must be sought partly in the circumstances governing the supply of money and credit throughout the world. But, on the other hand, we must look also to the

conditions affecting the supply of maize and the world's requirements. Prices are governed by the European demand for maize for stock purposes, and also by the surplus supply available from the larger producing countries. The world's supply is increasing, but the recurrence of unfavourable seasons in various parts of the producing area has kept prices high. Moreover, the world's demand for maize for stock and manufacturing purposes is increasing rapidly, and this will also tend to maintain prices, though it can hardly be expected that they will remain as high as they have been in recent years.

AVERAGE PRICE PER CWT. OF MAIZE AND WHEAT FOR THE
LAST TEN YEARS (1903-12).

		Maize Meal		Maize		Wheat (British)		Oats (British)		Barley (British)					
		s.	d.	s.	d.	s.	d.	s.	d.	s.	d.				
1903	...	5	11 $\frac{3}{4}$	...	4	11 $\frac{3}{4}$	...	6	3	...	4	3 $\frac{1}{2}$	...	5	8
1904	...	6	4 $\frac{1}{2}$	...	4	9 $\frac{1}{2}$	...	6	7	...	4	1	...	5	7
1905	...	6	3 $\frac{3}{4}$	...	5	3	...	6	11	...	4	4	...	6	1
1906	...	6	4	...	4	11 $\frac{1}{4}$	...	6	7	...	4	7	...	6	0 $\frac{1}{2}$
1907	...	6	5	...	5	5 $\frac{3}{4}$	...	7	1 $\frac{1}{2}$	...	4	8 $\frac{1}{2}$	...	6	3 $\frac{1}{4}$
1908	...	7	1	...	6	1 $\frac{3}{4}$	...	7	5 $\frac{1}{2}$	...	4	5 $\frac{1}{2}$	...	6	5 $\frac{1}{2}$
1909	...	7	7 $\frac{3}{4}$	...	6	2	...	8	7 $\frac{1}{2}$	...	4	8 $\frac{3}{4}$	...	6	8 $\frac{1}{2}$
1910	...	6	10 $\frac{3}{4}$	...	5	6 $\frac{3}{4}$	...	7	4 $\frac{1}{2}$	...	4	4	...	5	9 $\frac{1}{4}$
1911	...	6	11 $\frac{3}{4}$	...	5	6 $\frac{1}{2}$	...	7	4 $\frac{1}{2}$	...	4	6 $\frac{1}{4}$	...	6	9 $\frac{3}{4}$
1912	...	7	10 $\frac{3}{4}$	...	6	2 $\frac{1}{4}$	...	8	1	...	5	4 $\frac{1}{2}$	...	7	8

Meanwhile, maize is cultivated more extensively and produced in greater quantity than any other cereal save wheat, and its cultivation would be still greater were it not limited by climatic conditions. The total world's crop in 1913-14 was no less than 1,733,109,517 cwt., compared with 2,053,345,727 cwt. of wheat, and there are years in which the world's maize crop is actually bigger than the world's wheat crop.

Vegetable Oils at the (1914) Tropical Exhibition.

WANDERING round the French Court we found a group of friends "matching" three oil seeds, somewhat resembling a pale-coloured horse-chestnut, that they had been hoarding up for some time, and which by unanimous consent were voted to be *Butyrospermum parkii*, alias karite-nuts or shea-nuts, a nut with which much can be done if supplies are large and regular. The French section generally was certainly an easy first as regards a complete exhibit of vegetable oils and the various tropical products from which they are derived. Husked and unhusked coco-nuts were met with on all sides, also European-dried copra from Cochin China. M. Henri Woog, the broker, of Paris, had an attractive stall with a very representative collection of vegetable oils generally, intermingled with cereals, rubber and rice.

The Malayan court and the Kelantan stall both had coco-nuts and copra on view, the Ceylon court also; but a particularly interesting section in the last named was the desiccated coco-nut exhibit, made up of the well-known fine and coarse-grain kinds, also some new forms as shreds and flakes, &c., sent over on purpose to test the market and to see what the public here thought of them. For fancy cakes, confectionery purposes, curries, &c., we should imagine that these new forms will meet with

general approval and a consequent big demand. The Malay exhibits included the following for comparison: The nior ratus, or hundred coco-nut; nior jambu, or rose-apple coco-nut; nior blimbing, or blimbing coco-nut; nior kuning, or yellow coco-nut; nior rasumba, or rose-red coco-nut; nior gading, or ivory coco-nut; nior hijan, or green coco-nut; nior sekol; nior kapal, or ship coco-nut; nior gelok, or water-bottle coco-nut. Of "Fancy" coco-nuts in the Ceylon Court, though we did not notice samples, we were told that they include the "king coco-nut," which bears a yellow fruit, distinguished by its sweet juice and esteemed for culinary purposes, though the meat is of little value as copra. Then there is the "dwarf coco-nut," which bears fruit when only 2 ft. or 3 ft. high, and the nuts small in proportion. Their "needle coco-nut" coming from the Nicobar Islands, bears a large triangular fruit, the nut having a sharp point at one end. The "Maldivé coco-nut" has a small, almost spherical fruit, and the "edible-husk coco-nut" is furnished with a husk which, when young and tender, is fleshy and of a sweetish acid taste.

British Guiana is also making a bid for coco-nuts, which thrive well along the coastal lands of the colony, especially where the land is more or less sandy, and although the 5,000 acres under this crop in 1904 has already increased to 14,000 acres, a considerable expansion of their cultivation is still possible and expected.

Queensland was also there, and so were the New Hebrides, the Dutch West Indies, Fiji (discussed elsewhere), and, of course, Mr. O. W. Barrett and the Philippines, about which we say nothing, for once we begin discussing the *Cocos nucifera* in those islands there is no saying where we shall finish. Coming now to another centre and a latter-day competitor for the present demand for edible vegetable oils, we encounter British Honduras, and its cohune-nut (*Attalea cohune*) cousin of the Brazilian uricuri (*Attalea excelsa*), both of which could and do yield an oil that may yet make itself felt in the oil-buying and consuming world. Guatemala to the south also claims to have large cohune-nut areas, only they call them corozo-nuts. The palms yield from one to four bunches a year, each bunch weighing something around 1 cwt. each, of which the kernel accounts for 8 to about 14 per cent. only, with a percentage of 65 to 71 per cent. of oil. From accounts to hand the cohune palm flourishes in British Honduras along what is known as the cohune ridges. Many trees have been cut out when clearing the land for planting, but the "yarns" some company promoters want us to swallow about the wild palms being found as crowded as eighty to the acre, are surely a little too overdone.

WE are glad to see that Professor Copeland, of the Philippine Islands, in his book on "Coco-nuts," which we refer to on the page opposite, pays tribute to the important work on the same subject by E. Prudhomme, Director of the Jardin Colonial at Nogent, near Paris. (491 pp., paper cover. August: Challamel, Paris. Fcs. 14; or Dulau and Co., London. Price 11s. 3d.; postage 1s. 6d.). Professor Copeland speaks of it as being the best study of the varieties of coco-nuts."



"Tropical Life" Friend.—No. 113

MR. WILLIAM RAITT, F.C.S.

Cellulose Expert, attached to the Forest and Research Institute at Dehra Dun.

MR. RAITT and the work he has been and is still so ably carrying on in India has always interested us for many reasons, but mainly because as large consumers of paper we are, naturally, glad to see efforts, such as those put forth by "Our Friend," to increase the output of raw materials for paper-making, and secondly, because we are always glad to know of and to watch any efforts being made to increase the trade of our tropical dependencies, especially India, and in such work, so far as the output of cellulose is concerned, Mr. Raitt's long and exhaustive studies in connection with the subject and the paper-making industry generally has given him a knowledge of Indian cellulose-producing plants that is described by *Commerce*, of Calcutta, as being "absolutely unique." Certainly "Our Friend" has been well tried, whilst his reports on the research work he has done show that he allows nothing to escape him, and those following the work he is doing cannot but admire the business-like touch that pervades his official reports, for, although written for officials and officialdom, Mr. Raitt never loses sight of the fact that he is preparing and imparting his knowledge for a section of the public which must, sooner or later, and we hope it will be sooner, become more interested in the raw materials that India is gradually bringing to the fore.

This knowledge has not been obtained without hard work, with some twenty years' experience, of which the last ten have been devoted solely to investigating the future possible supplies of cellulose. "Our

Friend" is apparently convinced that (like the main food supplies of the world) the chief supplies of cellulose and paper-making fibres must come from the Tropics and Sub-tropics, where the raw material in the form of bamboo, coarse savannah grasses and the like, banana fibre, even coco-nut fibre (after the dust is removed to be utilized as the absorbing foundation for explosives instead of the more expensive kieselguhr) can be had almost as a gift from nature, who supplies them in huge quantities and at comparatively short periods.*

Such conditions as those to be met with in the Tropics are markedly different to those depending on a forest timber supply that takes forty years to produce, as is the case with spruce from which we suppose the bulk of the world's paper is now made (although that on which TROPICAL LIFE is printed is specially prepared from esparto in order to take half-tone blocks), and of which the increasing tendency for supplies to lag behind the demand, if not to become exhausted, is beginning to cause genuine alarm. Here, therefore, as with our food supplies, it is to the Tropics we must look, and that being so, one naturally thinks of India, where one of the leading men we first strike is "Our Friend," but whether India, Jamaica, or Costa Rica (with bananas), the Philippines, &c. (for coco-nut fibre), or elsewhere will only make the cellulose, or will run paper and paper-board-making establishments as well, remains to be seen.

From 1905-1909 Mr. Raitt seems to have carried on at his own expense investigations, both in the open and in the laboratory, as to possible raw materials for cellulose in nearly every part of India, from the west coast of Madras to Burma, Assam, and the Terai in the East. The bulk of the experiments showed that the material was not suitable on a commercial scale, that is not as a laboratory test; but one or two encouraging results, or rather the report of them in the technical journals, attracted the attention of the Conservator of Forests (Mr. P. H. Clutterbuck), who in 1910 was in charge of the Forestry Court at the Allahabad Exhibition, to which we devoted considerable space in our issues for October, 1910, and September, 1911. As a result Mr. Clutterbuck invited "Our Friend" to take charge of the cellulose laboratory, and through this Mr. Raitt laid the foundation for the highly successful investigations regarding bamboo and savannah grass as a raw material that have been carried on steadily ever since.

A Fellow of the Chemical Society, Mr. Raitt has published many reports on his life-work, including "Bamboos" (see *Indian Forest Records*, vol. iii. Part III), "Savannah Grasses" (*idem*, vol. v. Part III), "Cellulose in India" (in the *Indian Forester*), and since then—for it is some time since we had the pleasure of hearing from him—we believe has considerably added to the number, especially as his present position of Consultant to the Government of India gives him more chances of doing so.

* We might mention here that we are now working out some big problems with Messrs. Bertrams, Ltd., of Sciennes, Edinburgh, not only in connection with Indian paper-making materials, but also *re* banana fibre and coco-nut fibre, the latter for making boards. Since we visited Messrs. Bertrams' works in 1912, to inspect their £10,000 all-brass and other paper-making machines, we have been in constant correspondence with them with a view to helping our friends in the Tropics to develop paper, or, at least, cellulose-making industries with their waste products.

Business Notices.

1.—The address of **TROPICAL LIFE** is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

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3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of **TROPICAL LIFE**. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "**Tropical Life**" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

NOVEMBER, 1914.

A British Institute of Tropical Agriculture.

PROFESSOR WYNDHAM DUNSTAN'S PROPOSAL.

JUST upon four years ago Professor Dunstan advanced his epoch-making suggestion at the Royal Colonial Institute, that an Agricultural College be established in the Tropics, and, as he pointed out in his presidential address at the recent International Congress on Tropical Agriculture, we seem to be moving in the right direction to secure at least one college, even if, owing to the war, we shall not see it rise up in Ceylon next year as we had hoped. Now, Professor Dunstan has remembered the requirements of the profession of tropical agronomists over here as well as in the Tropics, for he told us at the close of the same presidential address, referred to above: "I have ventured to suggest three questions of general importance for special consideration, which it may be convenient to deal with in this way: (1) The establishment of an Imperial College of Tropical Agriculture, (2) the formation of a British Institute of Tropical Agriculture, which more particularly concerns the British Section of the International Association, and (3) the question of the constitution of the International Association, considered as a federation of central societies in the capitals of European countries, in communication with agricultural societies and institutions in the Tropics.

In his plea for a British Institute of Tropical Agriculture, Professor Dunstan said:—

"In dealing with the question of proper provision for technical education in tropical agriculture, as well as in considering other matters of importance to the subject, advance is retarded by the absence of any

unofficial society or institution in this country which can claim authority to speak in the interests of British tropical agriculture, and represent the opinions and promote the interests of those who are engaged in what ought to be regarded as an honourable profession. The matter is outside the sphere of any Government Institution, and the International Association for Tropical Agriculture, by reason of its constitution, obviously cannot assume these duties; in fact, British relations with the Association are hindered by the absence of any British society of the kind. Surely the time has come for the formation of a society comprising all interests in a subject which is so profoundly connected with the welfare of the Empire.

"I desire to submit to the British Section of the Association for its consideration, and for such action as it may consider expedient to take, the question as to whether it is not desirable to proceed to form a British Institute of Tropical Agriculture, whose functions would include the holding of meetings for the reading of papers, the discussion of all matters concerning tropical agriculture, and the consideration of education and qualification for the profession, and, in fact, doing whatever it may consider desirable to promote the interests of the subject of tropical agriculture, and of those who are engaged in it. My own experience in the period of twenty years during which I have been closely in touch with the subject, and with those who are working for it in all parts of the world, has led me to the conclusion that action in this direction is much needed, and that the establishment in this country of such an institute on the lines of those of other professional bodies, such as the Institutions of Civil, Mechanical, and Electrical Engineers and the Institute of Chemistry, and many others, would be welcomed by all those who, as specialists, planters, merchants, or manufacturers, are connected with the subject of agricultural production in the British Tropics.

"A British institute of the character indicated would, of course, be affiliated with the various agricultural societies in the British Tropics and with the International Association, and would, with great advantage, take over the work at present performed by the British Committee of the Association.

"The best method by which those countries which are connected with the International Association can co-operate in its work and strengthen its action are to be considered at a meeting of the members of the Association at the close of this Congress. I feel satisfied that the large work which lies before the International Association will be best promoted by a scheme involving the affiliation and close co-operation of a society or institution in each of the European countries interested in the advancement of tropical agriculture, and our Continental colleagues have expressed the wish that this opportunity should be taken to elicit the views of the British members on this important subject."*

* In face of the above and the war now going on, it is well to recall what we say in the preface to our book on "The Fermentation of Cacao," when discussing the need of trained men, especially on tea estates, viz: "As things now are, whilst the public get the benefit of cheaper tea, &c., and the Exchequer scoops in its millions of revenue therefrom, the planter is left alone to discover

In conclusion, we can only commend the idea to our readers, especially our own folk, and trust that they will collaborate with the "father of the idea" to develop it and make it grow up to a healthy and vigorous maturity. Meanwhile, we are glad to see that the *Ceylon Tropical Agriculturist*, more wide-awake than ourselves, having "spotted" the following remarks in the columns of our mutual friend, *Louisiana Planter*, reproduced it in their issue for September (p. 228):—

"In the May issue of *Tropical Life*, published in London under the caption of 'A Spendthrift's Budget,' the editor criticizes the English Government for taxing the people the equivalent of about a thousand millions of dollars without including in this enormous budget a satisfactory appropriation for the development of education in tropical medicine and tropical agriculture. Two tropical agricultural colleges have been asked for, one in the East, perhaps in Ceylon, and one in the West, perhaps at Trinidad, British West Indies, but nothing thus far has been done.

"The development of tropical industries along modern lines practically began in Louisiana some twenty-five years ago, when Dr. W. C. Stubbs started the Louisiana Sugar Experiment Station under the auspices of the Louisiana Sugar Planters' Association. The Far East, or at least Ceylon, has been urging an allotment of 2½ million dollars for the foundation of a tropical school in that famed island, where a high order of learning has been in vogue for more than a thousand years. It is now proposed to concentrate the intelligence of the country in industrial research work under the conditions that prevail in the Tropics. The vast capacity of the Tropics for production of foodstuffs, cotton and fibres generally, has obscured the necessity for a high order of teaching these arts.

"The success of our Louisiana Sugar Experiment Station and the enlargement of the work in Louisiana to cover all of the leading products of the State while preceded by the famous experiments of Lawes and Gilbert at Rothamsted, England, made Louisiana the starting-point for tropical research and experimental work, and we find that even the Japanese are working up to the very highest standards, and that the British East Indian Government is carrying on excellent research work at its various stations throughout the Indian Empire and so on throughout the whole tropical world. While Nature is bountiful in the profusion of its productions, yet the producers must be taught how to get the highest degree of effectiveness with the least expenditure of human labour and at the least total cost for labour. The progress made in the last thirty

how he can still turn out the tea as cheap, or still more cheaply, in the future, in spite of the higher wages, increased freights, and heavier expenses that are menacing him on all sides. Truly the British public is neither grateful nor wise; because a few men stake their all to feed them cheaply, and will go to the wall if adverse circumstances cause luck to go against them and stop the work, is it right, either morally or economically, to take no interest in such people? Would it not be a wiser policy to encourage them to further action by training them scientifically to the highest standard to fight our commercial battles, as we do the officers of His Majesty's Services to fight for us internationally; and in this training should we not show them how to handle the machines they will be called upon to use and train them to learn which to reject as unpractical and unprofitable and which to adopt as being likely to save them time, labour, and money?"

years has simply been marvellous, and the efforts now making to induce the English Government to take hold of the problems, including tropical medicine as one of the essentials, would seem to be a move in exactly the right direction, and the Editor of *Tropical Life* deserves much credit for his continued insistence on more consideration by the British Government of these projects."

Samoan News.

THE passing back of Samoa to the British flag makes the last batch of notes we have received from Mr. H. J. Moors of greater interest than ever, although everyone carefully studies all that he has to say. After discussing his previous letter *re* Dr. Friederichs and the Nasicornus Beetle, which we incorporated in our notes on that pest, published on p. 104 of our June issue, Mr. Moors goes on to say, "We find that the beetle, as well as the larvæ, are attacked by the fungus; they evidently get it when they go to the nice artificial nests we make for the female to oviposit in. Again, the infected mother beetles may fly up into the trees, and rub off some of this fungus on the walls of the galleries they are boring, and other beetles paying a friendly call also become affected, meanwhile the pest is diminishing, as becomes more apparent day by day." As we mentioned in the chapter devoted to the Fungus in our book on "Coco-nuts" (pp. 449-456), the beetles are particularly attracted to the "Tumus" or traps by the odours arising from rotting, fermenting cacao pods, and that both male and female beetles visit these frequently, to leave them with the infection well established on their bodies.

On June 5, or about two or three months before England took possession of German Samoa, including Upolu, on which Apia, the recognized capital of the group is situated, our friend again wrote: "Those who say coco-nut planting cannot or does not pay are misinformed. To confirm this, I will point out a few prosperous localities where coco-nut planters are obtaining excellent results, quite up to anything you speak of. Coco-nut planting is a very prosperous business in New Britain, in New Ireland,* and the islands surrounding them. One plantation was recently sold at a high figure, and has since paid dividends of 10 per cent. on the price, whilst large sums were put aside for extensions. Numerous successful plantations are to be found in German New Guinea; Messrs. Burns, Philp and Co., for instance, have four large estates in the British, and also in the German Solomons. Some of these are now paying good dividends, though too young to pay much, but they are being largely extended, and should be paying dividends during the coming year.

"In Fiji there are many fine coco-nut properties, some of which are reported to be paying good dividends. In Samoa the D. H. and P. Ges. (German Trading and Plantation Co.) last year paid 30 per cent. dividend, and carried forward a considerable sum, but how much of this was earned by the estate account

* These are, we believe, in the Bismarck Archipelago. New Ireland, if we are not mistaken, is, or was, known as New Mecklenburg, and New Britain as Neu Pommern. They have all passed to the English flag now.—(ED., T.L.)

and how much by the trading stations I cannot say, but as it was a bad year they evidently earned most of it from the estates, so I have not a doubt but that coco-nut planting is one of the most profitable enterprises anyone can engage in.

"But there, you should know this better than I. Messrs. Lever Bros., Ltd., now have immense plantations throughout the Solomons, and they will soon be making thousands of tons of copra, so that without a doubt no one will be better able to say whether coco-nut planting pays or not, is a safe or risky investment than Sir William Lever."

"As regards cacao, the canker killed a great many trees here last year. Probably not less than 50,000, as every planter suffered. Many experiments were tried with varying success, to try and check the trouble.

"At Ululalao, for instance, we applied a mixture made as follows: 20 lb. quicklime and 15 lb. flour of sulphur, boiled together in ten gallons of water for forty-five minutes; when cool, forty more gallons of water were added, and this mixture was then painted on all cacao tree stems up to where the branches start. This is done in dry weather, and though it goes on with a rather greenish yellow colour, it dries out perfectly white, thus leaving a thin but effective scale which, we believe, is a mechanical protection against canker, whilst the sulphur is a fungicide and may otherwise help.

"We at Ululalao are keeping a sharp look out after all of our trees, and trying to discover canker spots as rapidly as they become visible. The whitened tree stems aids this search, for the red-brown canker stain is visible very clearly if present on this white background.

"One Chinaman can apply this wash very nicely to about 125 trees in a day of nine hours, and a smart fellow will do up to 200. The cost, therefore, is trifling, and we think the protection great. The application does not prevent the tree flowering right through this mixture and bearing fruit as usual on the stem.

"We are finding that the trees which are passing into their eighth year need fertilizing, and are successfully applying sulphate of potash, about 1½ lb. to each tree, combined with 4½ lb. coral sand as carbonate of lime; we think the resultant crops amply repay the outlay. We hope you will find these details of use."

Economic Zoology.

Our Motto: "Utilization, not Extermination."

SPECIAL Leaflet No. 8, issued by the English Board of Agriculture, on the "Utilization of Cereal Offals and certain other Products for Feeding Purposes," is worth being studied by planters, *i.e.*, producers abroad, as well as the consumers, *i.e.*, the farmers and stock-raisers at home, for whom the leaflet is intended. We say this because among the feeding stuffs dealt with are soya bean cake and meal, coco-nut cake, palm-nut cake, of which the following statements are made:—

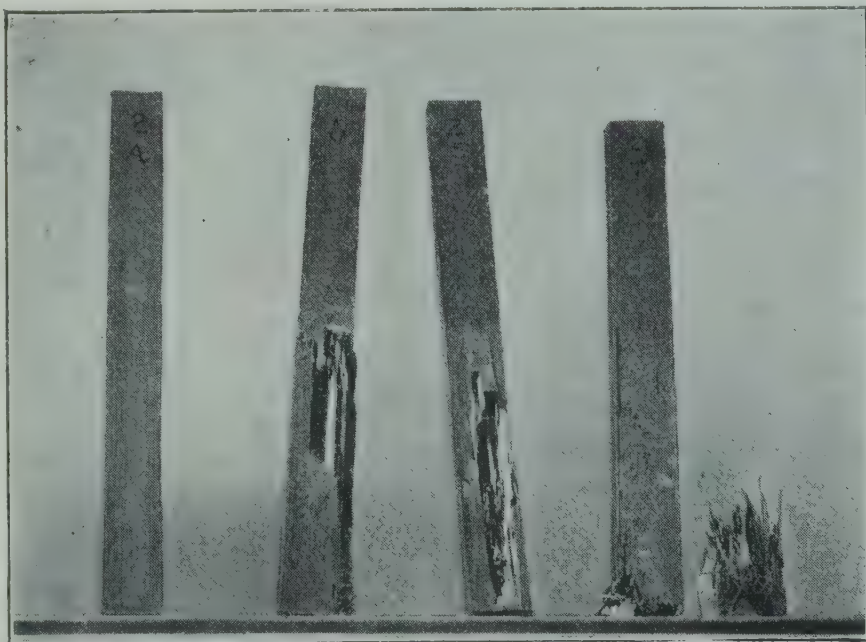
Soya Bean Cake and Meal.—Soya bean cake is made

from the bean of a leguminous plant (*Soya hispida*). This bean has long been extensively grown in the East, where it forms an important article of human food, but only since 1908 has it been imported in quantity into this country. It differs from the common field bean in being rich in oil. To a small extent the soya bean itself is used as a cattle food, but, as a rule, the greater part of the oil is first removed by seed crushers, the residual cake or meal being used for feeding purposes. In the ordinary course the oil is removed by heat and pressure, the residue being in the form of a cake which still contains a considerable percentage of oil. A soya bean meal is also sold, and from this nearly the whole of the oil has been extracted by means of a chemical solvent.

Soya bean cake usually contains 40-45 per cent. of albuminoids and 6-8 per cent. of oil. It therefore approaches decorticated cotton cake in composition and should be fed in the same way in moderate quantities along with starchy foods, such as the ordinary cereals and their offals, and with roots, hay and straw. "Extracted" meal is much poorer in oil than the cake, containing only about 2 per cent., but it is correspondingly richer in albuminoids. It should be fed in moderate quantities along with other less concentrated foods. Soya bean cake and meal have a high manurial value, similar to that of decorticated cotton cake, and considerably higher than that of linseed cake.

Coco-nut Cake.—Coco-nut cake is made from the fleshy portion of the coco-nut after the oil has been extracted. It is not largely used for feeding in this country, but is in considerable request on the Continent. An average sample of coco-nut cake may contain 22 per cent. of albuminoids and 10 per cent. of oil;

For the War.—No. 5.



Results of an application of Atlas "A" (in this case in the Tropics) supplied by the Atlas Preservative Co., Ltd., Deptford, London, S.E.

This test was carried out by influential clients in Hong Kong as follows:—

Each of the Pinewood Stakes was painted with two coats of preservative, each coat being allowed to dry for 24 hours.

Sample No. 2 A, shown on left, treated with Atlas "A,"

Three Samples on right treated with other well-known preservatives.

Buried for 12 months in White Ant infested ground for half their length—the tops halves being exposed to the weather and not disturbed.

The results as above show the sample on right was eaten away in the centre until the top fell over. The two centre samples are eaten quite hollow, but still remain upright. Sample No. 2 treated with A Atlas is sound and intact in every way.

it is thus not so rich in flesh-forming substances as linseed cake, but in other respects is not dissimilar to that feeding-stuff. On the Continent coco-nut cake is favoured as a food for dairy stock. It is fed in quantities of from 3 lb. to 4 lb. a day, and is said to be eaten readily. Reliable data as to its uses for stock feeding in this country are lacking. Theoretically it should be about equal to linseed cake, and farmers would be well advised to give it a trial if it can be purchased, as it is not unlikely that it may be, at three-fourths of the price of linseed cake.

Palm-nut Cake.—Palm-nut cake is made by pressing the kernels of the nuts of the oil palm, a species of palm that is grown extensively in the West African Colonies and Protectorates. Almost the whole export of this produce has hitherto gone to Germany, where large factories have been erected for crushing the kernels and preparing the products for market. It is hoped that it may now be possible to arrange for the crushing of palm nut kernels in this country. The kernel contains about 50 per cent. of oil, and after crushing is sold in the form of either cake or meal containing about 10 per cent. of oil and 16 per cent. of albuminoids. The meal is sometimes further treated with chemical solvents and its contents of oil may then be reduced to as little as 1.5 per cent.

Palm-nut oil, which is largely used for human food, is very suitable for certain classes of stock, and while there is not sufficient information available to enable a definite comparison to be made between palm-nut and linseed oils, the experience of foreign stock-feeders would appear to indicate that palm-nut cake would make a very good substitute for linseed cake in feeding dairy cattle. Cows may receive up to 5 lb. per head per day.

Palm-nut cake does not keep so well as linseed or cotton cakes, and users should not lay in large stocks. The rations suggested below suppose an average master as well as an average animal. The costs are given to the nearest halfpenny (less in the case of the sheep). The prices of roots, hay and straw have been taken as 10s., 60s. and 30s. per ton respectively. The prices of other feeding stuffs were those ruling in London in September:—

Farm Horses.

RATION 1.	s.	d.	RATION 2.	s.	d.
18 lb. hay ...	...	...	18 lb. hay ...	...	...
14 ,, oats ...	...	...	6 ,, dried grains ...	...	...
	1	8	2 ,, sharps ...	...	...
			4 ,, bran ...	...	...
			2 ,, maize ...	...	...
				1	2

Light-legged Horses.

RATION 1.	s.	d.	RATION 2.	s.	d.
10 lb. hay ...	...	...	10 lb. hay ...	...	...
16 ,, oats ...	...	...	6 ,, oats ...	...	...
	1	7	2 ,, beans ...	...	...
			5 ,, dried grains ...	...	...
			2 ,, bran ...	...	...
				1	3

Fattening Bullocks (2½-3 years old).

RATION 1.	s.	d.	RATION 2.	s.	d.
70 lb. swedes or mangolds	70 lb. swedes or mangolds	...	...
16 lb. oat straw	16 lb. oat straw ...	...	...
2 ,, undecorticated cotton cake	2 ,, undecorticated cotton cake	...	...
3 lb. maize	3 lb. dried grains ...	...	...
2 ,, linseed cake	3 ,, bran ...	...	...
	1	0		0	10½

RATION 3.	s.	d.	RATION 4.	s.	d.
70 lb. swedes ...	...	...	35 lb. swedes or mangolds	...	...
12 ,, oat straw ...	...	...	7 lb. hay ...	...	...
4 ,, undecorticated cotton cake	...	...	10 ,, oat straw ...	...	...
4 lb. bran ...	...	...	2 ,, undecorticated cotton cake	...	...
	0	10½	2 lb. soya bean cake	...	...
			2 ,, sharps ...	...	...
			2 ,, dried grains ...	...	...
				0	10½

Cows.

RATION 1.	s.	d.	RATION 2.	s.	d.
42 lb. swedes or mangolds	...	...	42 lb. swedes or mangolds	...	...
5 lb. hay ...	...	...	5 lb. hay ...	...	...
14 ,, oat straw ...	...	...	14 ,, straw ...	...	...
4 ,, crushed oats ...	...	...	4 ,, coco-nut cake or palm-nut cake	...	...
4 ,, decorticated cotton cake	...	...	3 lb. dried grains ...	...	...
	1	2	2 ,, bran ...	...	...
				0	11

RATION 3.	s.	d.
28 lb. swedes or mangolds...
14 ,, hay
7 ,, straw
2 ,, cocoa-nut cake
2 ,, undecorticated cotton cake
3 ,, dried grains...
3 ,, bran
	1	2

The following are suggested as suitable rations for sheep to be fed along with grass, or roots and hay at times when concentrated foods are necessary:—

Breeding Ewes.

Ration 1.—From ½ lb. to 1 lb. per head per day of oats, bran, and decorticated cotton cake, mixed in the proportion of one-fifth decorticated cotton cake to two-fifths of each of the others— $\frac{4}{5}$ d. per lb.

Ration 2.—The same weight of a mixture of equal parts of soya bean cake, bran, and dried grains— $\frac{3}{5}$ d. per lb.

Fattening Sheep.

Ration 1.—From ¼ lb. to 1 lb. per head per day of a mixture of equal parts of maize and decorticated cotton cake—1d. per lb. (nearly).

Alternative Ration.—The same weight of a mixture of dried grains and soya bean cake— $\frac{3}{4}$ d. per lb. (nearly).

When one hears of English farmers being prejudiced against soya bean cake, or preferring cotton and linseed cake to it, it is to be hoped that this leaflet will encourage the use of these others, soya, palm-nut and coco-nut cake, as well.

CONSULAR reports tell us that about 2,500 tons of tea-seed cake are produced annually in the Foochow district, whence this product is exported to Formosa for use as a fertilizer for rice and other crops. When fresh, these cakes weigh 6 lb. each, dwindling down to 4½ lb. when old, and are sold by number at about \$34 (about 63s.) to \$26 (or 49s.) per 1,000 delivered to the go-down.

In 1913, said the Report on Tea in Assam, there was a keen demand for tea-seed in Sibsagar, as in the previous year. Prices varied according to quality, but appear to have ruled lower than in last year. Trade statistics show that 7,671 maunds of tea-seed were exported from Assam, principally to Calcutta. In Lakhimpur and several other districts the demand for the seed was less.—From Tea Report.

The London Produce Markets.

FINANCE AND INDUSTRY.

THE moratorium came to an end without any blowing of trumpets on the one hand, and, so far, without weeping or gnashing of teeth on the other. The truth is that in this, as in other matters, by a praiseworthy system of co-operation between the Government, the banks, and the public the more serious shocks have been warded off, even if they cannot be entirely avoided. Although, of course, we are as far as ever from the final settlement in many respects, there are many now who can sleep more peacefully than they have been able to do for a month or six weeks past.

An excellent return was issued by the Bank of England at the beginning of November, and the following table, which we take from the *London Times*, shows the position on November 4th, as compared with the week previous, and also a year ago:—

	Nov. 4, 1914	Oct. 28, 1914	Nov. 5, 1913
Bullion	£69,474,113	£61,872,740	£36,772,121
Notes in circulation	35,580,000	35,112,670	28,739,935
Public deposits ..	16,450,904	24,993,910	7,131,899
Other deposits ..	140,293,123	126,736,526	42,396,998
Rest	3,193,737	3,210,364	3,189,072
Govt. securities ..	17,204,087	19,427,087	11,788,175
Private securities ..	104,904,925	104,868,405	29,034,901
Reserve	52,394,113	45,210,070	26,482,186
Proportion .. ..	.. ..	33.4 %	29.8 %
Price of Consols ..	.. ..	68½ %	.. ..
Bank rate .. ..	.. ..	5 %	5 %
Price of bar silver ..	.. ..	23d.	.. ..

New York at the same time reported that her money market had been easy throughout the week ending November 7th, and both call and time loans have been readily obtainable at 6 per cent. For renewals the rate remains at from 6 per cent. to 7 per cent., much depending on the quality of the security. Commercial paper has been in fair supply, and discount rates range from 6 per cent. to 7 per cent. for good names. Foreign exchange has been quiet, with both sterling and francs harder.

The Wool Markets continue to be well attended, and, taking those of November 5th as a type, we have to report that the offerings embraced some very good lines of both greasy and scoured, the best of the first-named descriptions, which were found among the Sydney wools under the "Goondooblue" mark, selling up to 1s. 3½d. per lb., and those from Queensland at 1s. 2½d., while greasy half-bred lambs from Victoria, marked "K in diamond," reached 1s. 5d., and scoured super-crossbred of the "Atlas Works" brand 2s. 4d.; merino combings, 2s. 3½d.; and comeback clips, 2s. 3½d. Another good scoured clip, marked "Gibb," sold at correspondingly high figures, merino combings and lambs' wool fetching 2s. 3½d.; super-crossbreds, 2s. 3d. Cape wools attracted much more attention, the best of the super snow-white selling at 1s. 11½d., and greasy combings at 9¼d.

There has been (reported Messrs. Zorn and Leigh-Hunt on November 11th) "a further improvement in the price of plantation rubber to 2s. 5d. per lb. (smoked sheet, 2s. 6½d.), and, in spite of the war, the statistical position of the commodity is favourable to producers. This is largely due to American con-

sumption, recent figures showing a considerable increase in the quantities of rubber sent to the U.S.A. Russia has also been taking more than usual, so the stoppage of German imports of raw rubber has been more than compensated. A shrinkage of supplies (especially in the case of wild rubbers) has also helped the situation, with the result that stocks in the United Kingdom are 1,500 tons lower than at this time last year.

So far as the Share Market is concerned, there is a satisfactory tendency for cash dealings to expand, and quite a little stream of investment business has been noticeable during the last week or two. The supply of good-class shares is decidedly restricted, and, owing to this cause, transactions are rather difficult to effect, in spite of the fact that all transactions are still for cash only. The satisfactory reports issued by a number of companies since our circular was last issued have led to inquiry from investors, and it will be noticed that various quotations have consequently improved as compared with those appearing in our previous list.

Coming now to Produce Market news generally, we have gathered together the following particulars.

Coco-nut Products, &c.

As vegetable oils generally are affected by the fluctuations of linseed oil, we will start by saying that with this article November 7th closed what had been an excited market with a large business in all positions, and if prices at the close showed a drop of 10s. below the highest point touched, so wide had the fluctuations been that prices were still 37s. 6d. to 45s. above the previous week, with London rates as follows: Spot pipes £22 10s., barrels £22 15s., November, £22 15s., November-December £22 17s. 6d. (£23 10s. paid early), December £23 (£23 10s. paid early), January-April £23 17s. 6d. accepted at the close (after £24 10s. being asked earlier). Against this Hull reported: Naked spot £22 2s. 6d., November-December £22 7s. 6d., January-April £22 17s. 6d.

Coming now to Coco-nut Oil, Messrs. Goodlake and Nutter report that the market still remains very firm, and business difficult to transact as there is very little oil offering by shippers, and this mostly for distant periods, Ceylon, November-December or December-January shipments. There is still a good inquiry for afloat. They quoted "near" afloat on November 7th at 46s., November 43s., December 42s. 6d., December-January 42s., c.i.f. London. Cochin Oil: There is not much demand for forward positions, and anything near at hand would find a market. They quote 48s. 6d. for afloat and 44s. October-December. Pressed Oil: There is very little offering. For prompt delivery there would probably be sellers at 41s. 6d., and November-December 40s. in Ceylon casks. Palm Kernel Oil: The demand is not quite so active. For prompt delivery quotations included £46 10s., against November-December £45 5s., full terms, f.a.s. Liverpool. Spot prices: Ceylon £48 to £50, Cochin £56 to £58.

We have not encountered any quotations for Soya beans, nor Soya bean-oil, beyond one for Oriental in

cases, spot London £25, and Hull spot £24 15s. ton. Lagos Palm Oil in London is quoted at £33, against £35 10s. a year ago, whilst Palm-kernel Oil is put at £46, against £45 or a little more about this time last year:

As several of our readers have been asking for news of oil cake (see p. 213, *re* "Oil Cakes as Feed") we are including the following in this issue. Up at Liverpool, imported Linseed Cake was held for £8 15s. per ton for American Western and Bombay, and in fair request. River Plate is nominal owing to scarcity. A very fair inquiry is going on for all local makes, and crushers still quote £10 to £10 10s. per ton, according to brand.

American and Peruvian decorticated Cottonseed cake was without change in value at £8 10s. to £8 12s. 6d., and £8 15s. per ton, respectively, and attracted a fair amount of notice. Local makes of decorticated and undecorticated Cottonseed was moving off to a very fair extent, and quotations were maintained at £8 17s. 6d. to £9 7s. 6d. for the former and £5 15s. to £6 5s. per ton for the latter, according to brand. Egyptian was in fair demand, and £5 15s. per ton is still asked for spot and forward parcels.

In London quotations included: Linseed Cakes, best London made £8 10s. to £8 15s. ex mill, American £8 10s. ex docks, Canadian £8 7s. 6d. ex docks.

Cotton Cakes.—Best English made £5 15s. to £5 17s. 6d., Bombay £5, Egyptian £5 12s. 6d.

Coco-nut Oil.—Ceylon spot £48, afloat £45 c.i.f., September-November £42 10s. c.i.f., November-January £42 c.i.f. Cochin spot £56, afloat £49 10s. c.i.f., November-December £44 c.i.f. London pressed November-December £40.

Copra is firm, and quoted for shipment to London: Ceylon October steamer £24 buyers and October-November £23. Malabar October-November £23 10s. buyers. F.M.S. Singapore October £24 5s. sellers, and October-November £22 5s. buyers. South Sea October-November £21 5s. buyers. To Marseilles: F.M. Straits September-October £23 5s. buyers, and October-November £22 paid, and buyers. Cebu afloat £24 12s. 6d. buyers. Manila August-September £24 buyers, October-November £21 7s. 6d. and November-December £21. To Holland: Java August-September £27 5s. sellers, and October-December £25 10s. c.f. and i.

It may not be out of place to mention here that, according to the *Times*, it has been officially announced in Liverpool that Messrs. Lever Brothers and Joseph Watson and Son, Leeds, have acquired all the shares of the Planters' Margarine Company, a new company just formed with a capital of £500,000, which it is intended to increase as and when required to £2,000,000, to carry on the business of margarine manufacturers and nut and seed edible oil millers and refiners. Sir William Lever is chairman of the company and Mr. Joseph Watson vice-chairman.

The firm of Loders and Nucoline, for the year ending August 31st last, propose a balance dividend of $7\frac{1}{2}$ per cent. on the old Ordinary shares (making $12\frac{1}{2}$ per cent. for the year) and at the rate of $12\frac{1}{2}$ per cent. per annum on the new Ordinary shares, calculated in accordance with the terms of their issue, and further,

to place £1,000 to reserve and carry forward £1,079, against £1,096 brought in. The Nucoa Butter Company of New Jersey, U.S.A., have taken over the experimental margarine plant, and for this and for processes and services rendered they have agreed to allot to this company a block of their fully-paid shares.

Addressing the shareholders of Messrs. A. and F. Pears, Ltd., at their meeting on October 29th, Sir Thomas Dewar, the Chairman and managing director, referred to their agreement with Messrs. Lever Bros., Ltd., who now have interests in sixty-four companies interested in soap-making. In spite of the amalgamation, or as Sir Thomas Dewar put it, the permanent working agreement with Lever Bros., they still remain A. and F. Pears, with the debentures, as before, at 5 per cent., the preference shares at 6 per cent., whilst the ordinary shares, which paid 10 per cent. in the past, are now preferred cumulative ordinary shares at 12 per cent. Sir Joseph Beecham, Bt., seconded the resolution to pass the report.

Messrs. Wm. Gossage and Sons, Ltd., the soap manufacturing concern, which was acquired by Messrs. Brunner Mond and Co., Ltd., in 1911, offered for public subscription on November 9th 450,000 5 per cent. first cumulative preference shares of £1 each, at 18s. a share free of stamp duty and transfer fee, yielding £5 11s. per cent. to those taking up the shares.

Cotton.

MARKET reports for this article are still non-existent, and we have again to turn to the daily Press for our news. According to the *Times*, for instance, although less active than of late, the demand for actual cotton up at Liverpool has been fairly brisk, consumers still competing freely for desirable grades. The request for cotton near at hand continues, but most of it has already been sold. A fair turnover resulted in American and quotations were raised 9 points for middling and below. Middling, 4·64d. As a result of the ballot 42,800 bales of May-June were allotted at 4·25d. The market was recently reopened for restricted trading after a happy speech by the vice-president and the singing of the National Anthem. The business in May-June commenced at 4·40d., or 15 points over the official liquidating price, and with spinners calling freely, values at one time registered a gain of 20 points. Towards noon the price eased, and at midday stood at 4·34d., or 9 points dearer. In the afternoon trading was featureless, and the close was quiet at a net gain of 9 points at 4·34d. In Egyptian contracts, January, after being 11 points higher, eased off, and closed at 7·04d., or 9 points up. Until further notice, the market will open at 11 a.m.

From America we hear that the market was quite steady with a fair inquiry, and Egyptian in good request at previous rates. In East Indian a good business was done, but quotations of Tinnivelly and American seed Tinnivelly were reduced 10 points. Brazilian steady and unchanged. American future, May-June, 4·25; Egyptian future, January, 6·95. Values in America included:—

Middling American	..	..	4.55d.
Middling fair American	..	..	5.70d.
Fair Pernam	..	..	5.10d.
Fair brown Egyptian	..	..	6.20d.
Fully good fair brown Egyptian	..	..	6.90d.
Good M. G. Broach	..	..	3.95d.
Fully good M. G. Broach	..	..	4.10d.
Fine M. G. Broach	..	..	4.25d.
Good M. G. No. 1 Oomra	..	..	3.95d.
Fully good M. G. No. 1 Oomra	..	..	4.10d.
Fine M. G. No. 1 Oomra	..	..	4.25d.
Good M. G. Bengal	..	..	2.95d.
Fully good M. G. Bengal	..	..	3.05d.
Fine M. G. Bengal	..	..	3.20d.
Fully good fair Tinnivelly	..	..	4.15d.
Good Tinnivelly..	..	..	4.30d.

The India-rubber Market.

PUBLIC sales are still withheld, but there is no reason why any should take place; what sells, sells easily, and those qualities that do not attract the large buyers are not likely to do any better if dragged before the limelight of the public sales. It is times like the present that prove the advantage, one could even say the necessity, of planters, whether of rubber or cacao, to turn out a good class of article,* *above* all to send to market what buyers want and not what the energy, or the lack of energy, on the part of the producer is able to turn out. Good, reliable standard qualities, that the Government and "Our Men at the Front" can depend on, are what is wanted, and he who sends anything else deserves to be kept waiting for his money, as the fault is his for not having acquired the machinery necessary to turn out "the best" when prices were high; even now, however, planters would be well advised to see what they do send is No. 1 quality, as then they can still sell quickly and at a fair price, leaving enough profit to enable them to buy one of the approved smoke-curers, and to "live happily ever after" on the increased profits made.

Up at Liverpool the Pará market has been about steady, closing on November 6th at hard fine 2s. 6½d., soft fine 2s. 2d., Caucho Ball 1s. 10½d., and scrappy negroheads 1s. 9d. per lb. Medium Brazilian grades have been quiet and unchanged. The African market has remained steady, with small sales making, including Conakry sheets and strings 1s. 11½d., Gold and/or Ivory Coast lump 1s. 1d., and ditto rejections 1s. per lb.

Following the same hand-to-mouth policy as for coffee, New York has run short of rubber, and consequently has to pay very high rates for it and advance prices on manufactures in proportion. The small stocks of rubber have advanced in price since about August 1st over 100 per cent., and there is no telling how high

prices may go unless some relief is quickly found. The trouble, as in the case of coffee, lies in the financing of shipments from the East as well as from the Amazon, which, as also in the case of coffee, has prevented Brazilian producers from getting any but very partial advantage of the high prices lately ruling in the United States. Meanwhile the industry in England is wonderfully active, thanks to war demand, which filled the gap caused when there was a slack demand from the States.

Continued firmness has characterized the London market for Plantation rubber throughout the week, owing to the good demand from America, and also the home manufacturers, reported the *Public Ledger* on November 7th. This caused daily advances to take place, Standard Crêpe and Smoked Sheet closing fully 2d. per lb. higher than a week ago, off-quality and palish Crêpe being about 3d. dearer, and the lower qualities 2d. to 3d. per lb. At the same time the Pará market was also firm and dearer, but not to the extent of Plantation. It is interesting to note that the premium on spot Pará, as compared with spot ribbed Smoked Sheet, has now disappeared. A moderate business has been done. Hard Fine on the spot sold up to 2s. 7½d. and further buyers, November delivery to 2s. 7¼d. and value, and December up to 2s. 8d. and sellers. Soft Fine has been quiet, spot closing 2s. 11½d. sellers, November delivery 2s. 1½d. and December 2s. 1d. Negroheads steady but quiet, with sellers of Manaos Scrappy on the spot at 1s. 9½d. Cametas quoted 1s. 1½d. to 1s. 2d., and Island nominally 1s. Caucho Ball quiet but steady. On the spot there are sellers at 1s. 11d. and buyers at 1s. 10½d.; forward quoted 1s. 10d.

Since then the market has declined for Eastern Plantation Rubber on the news of the capture of the *Emden*, Messrs. S. Figgis and Son tell us on November 12th, and we close with value of Standard Spot Crêpe, 2s. 3d.; Ribbed Smoked Sheet, 2s. 5½d. to 2s. 6d. Pará grades are slightly easier, sales of December-January delivery Hard Fine, 2s. 6½d.; soft fine, 2s. 1d. Eastern Plantation Standard Crêpe closes 2s. 3d.; December, 2s. 2¾d. to 2s. 3d.; Ribbed Smoked Sheet, spot, 2s. 6d.; December, 2s. 5d. Hard Fine Pará, spot, 2s. 6½d.; December, 2s. 6½d. Soft Fine Pará, spot, 2s. 1d.; December, 2s. 1d.; Scrappy Negroheads (Manaos), 1s. 9½d.; Cametas, spot, 1s. 1½d. to 1s. 2d.; Island, nominal, 1s. Caucho Ball, spot, 1s. 10½d. to 1s. 11d.; Forward, 1s. 10d.

Coffee.

UNDER present conditions the export business has come to a comparative deadlock, as dealers resist the decline, counting, with certain reason, on lighter receipts, so writes Mr. J. P. Wileman in his weekly letter, "Mainly about Coffee," of October 15th. With all this, he goes on to say, there is still a fair amount of business carried on to complete shipments, at prices which are about 200 reis below the highest, for fine and selected qualities. The fall of Antwerp, where a stock of about 1,000,000 bags was stored, if not destroyed by the bombardment, will put Germany and Austria entirely past the necessity of importing

* "Many thanks for the copy of your October issue," wrote Mr. Arthur Knapp, whose articles on the "Fermentation of Cacao" ran through our March-July issues. "I note what you say (on p. 186) about the paper by Mr. Booth and myself at the International Congress at the Imperial Institute. You also remark that Mr. Booth read the paper; this is not correct, as it was I who read it. The present state of the market makes it apparent that those planters who have followed Mr. Davis' advice and not fermented their cacao, must, at the time of writing, be experiencing considerable difficulty in disposing of their unfermented cacao, even when they have managed to keep it from being mouldy."

any coffee for more than a year. Meanwhile, there is no lack of coffee in France, where stocks at end of September amounted to 1,384,000 bags, of which 717,000 were Brazilian, as against 405,000 last year. As regards Germany, there has been some talk lately of the sale of valorization stocks at Hamburg to the German Government on the basis of 58 marks (72 frs.). It is true that the S. Paulo Government protested that no sales of valorization coffee would be made this year, but circumstances alter cases and no one could have foreseen the effect of this war on prices or the ability of debtors to meet their engagements.

As regards the London spot market, the larger supply at the auctions held the week ending November 7th met with good competition, and firm to dearer prices were realized. Central American commanded firm rates to 2s. advance. Dumont Santos was in active request, and prices are 3s. to 5s. above those of last sale. Prices realized included: Jamaica, small fine hard greenish 92s. 6d., fine middling 103s. 6d., bold fine 109s., ordinary palish 50s., pea-berry fine 109s.

Costa Rica.—Small common to fair mixed 50s. to 60s., ordinary to fair ordinary mixed brownish and palish 55s. to 61s., low middling mottled pale greyish 63s. 6d., bold common to fair mottled greyish and greenish 65s. to 69s. 6d., pea-berry common to good 52s. to 71s. 6d.

Guatemala.—Pickings 50s., small fair colory 55s., good ordinary mottled pale greyish 54s. 6d., good middling colory 69s., bold common mixed 59s., fair mottled pale greyish 64s., good brownish colory 74s., pea-berry 55s. to 68s.

Vera Paz.—Small good greyish 56s. 6d., low middling faded greenish 62s., bold common mixed greyish 64s. 6d., good dull colory 83s. 6d., pea-berry 80s.

Salvador.—Small fair dull colory 52s. 6d., middling 65s., good bold 71s., pea-berry 64s.

Mexican.—Small fair mixed greenish 49s. 6d. to 53s. 6d., middling greenish and colory 62s. 6d. to 66s., good middling 67s. 6d. to 69s., bold fair to good 70s. 6d. to 75s., pea-berry 63s. 6d. to 72s.

Colombian.—Small fair to good greenish and colory 46s. 6d. to 53s., fine 60s., low middling palish 55s., middling to good middling greenish and colory 61s. to 66s., bold fair to good 65s. to 69s. 6d., fine 71s. 6d. to 73s., pea-berry 62s. 6d.

Ecuador.—Bold palish foxy 54s.

Uganda.—Small rough greenish 47s. 6d., bold dull greenish colory 63s., pea-berry 69s.

Mocha.—Long-berry greenish 89s.

Washed *Dumont (San Paulo)*.—Very small 43s. 6d. to 50s., small common mixed 48s. 6d., good 57s., medium common mixed 50s. 6d., fair to good 59s. to 63s. 6d., bold 64s. to 67s. 6d., extra bold 66s., pea-berry 58s. 6d. to 61s. 6d. Unwashed *Dumont*.—Quay terms, small mixed cherry 49s. 6d. to 51s. 6d., medium 51s. to 55s., bold 56s. 6d., extra bold 55s. to 59s. 6d.

Sugar.

"THE speculative purchases made in New York and elsewhere," wrote *The Louisiana Planter* at the end of October, "before the English Government placed a maximum price on white granulated, are evidently

becoming exhausted, and the normal demand for consumption is taking place. . . . More activity in the sugar trade is now at hand," whilst elsewhere we are told, when discussing the sugar situation, generally, that "the sudden advances in sugar, which were thoroughly justified, based upon the prospective loss of a very large fraction of the European crop, were cut short by the edict of the English Government, that white sugars in England should not sell at over 7½ cents per lb. This order paralysed the market of the cane sugar world for the time being, and gave the English Government the opportunity to commandeer all of the sugars of its various Colonies. According to Prinsen Geerligs, now that the war is being seriously prolonged, and will probably continue for many months to come, it will be almost impossible to successfully harvest the beets within the war area, or to manufacture the roots into sugar without a very considerable loss, as compared with normal results." Meanwhile, even if Germany can produce all she requires this crop, France and Belgium, next year, may have to import, and Java, with a shorter crop than usual, has already contracted for a large part of its sugar to go to England, as also has Cuba, although, of course, the proportion to her total output is smaller. In our October issue we gave particulars of these purchases (Java, 500,000; Cuba, 250,000). All these and other causes are certain to make for higher prices next year, no matter how the war goes. The estimated crop for Java for 1914-1915 has been reduced from 1,350,000 to 1,280,000 tons, against, perhaps, 2,500,000 tons from Cuba.

In London the Sugar market has been inactive owing to the recent heavy arrivals which have enabled the dealers to supply themselves with sufficient stock for their immediate requirements. The fair supplies of Crystallized offered at the auction on November 6th, nearly all sold at a material decline; this too, in face of the Sugar Commission's official statement, issued on November 3rd, that there is no truth in the rumour that another reduction in price is impending.

London sales include White Java on the spot at 26s. 6d., and affloat at 22s. 6d. to 22s. 9d. c.f.i. London. White Mozambique at 26s., and White Mauritius at 25s.; against this the Sugar Commission are holding American granulated on the spot for 27s. 6d., and White Java for 26s. 6d. Generally speaking, the market shows no change, except Crystallized which are 1s. to 1s. 6d. lower, and a quiet tone still prevails for cane sorts, and, when a parcel of 576 tons of Crystallized were offered for sale, they met with a slow demand, selling, as stated above, at 1s. to 1s. 6d. lower, and syrups 1s.—say: Demerara Crystallized pale greyish 24s. 9d., good to fine bright yellow 26s. to 26s. 9d. Trinidad, fine bright yellow, 26s. 6d. Jamaica, low brownish, 24s. 9d.; washed and bulked, 22s. 6d.; Nevis, dabs, 17s.; Demerara Syrups sold, low soft greyish, 15s.; low middling yellowish, 15s. 6d.

Surinam.—Crystallized, low middling to good yellowish, 25s. 6d. to 26s.; syrups, low soft greyish, 15s.; low to middling grainy brownish, 15s. 3d. to 16s. 6d.

On November 16th the Sugar Commission were still holding American Granulated for 27s. 6d., and White Java for 26s. 6d.

Tea.

With Indian kinds, the average for the whole sale on November 5th was 10½d. per lb. compared with 9½d. per lb. a year ago. With Ceylons, leaf teas were in still greater request than Broken, and the average realized for the whole sale on Garden Account was 10½d., against 9½d. per lb. at this time last year.

As we go to press, it is announced from the House of Commons that duty has been again advanced to 8d. per lb.

The London Cocoa Market.

By THE EDITOR.

THE cocoa market, like the war, goes on steadily and monotonously and reports of any change that does take place show, like the progress of the Allies, either a more assured position or else they mark an advance. One can only hope that this may continue until the end, and, above all, that the end will not be long coming. As regards the war, we do not think it will be.

Going more into detail, prices even of the commonest kinds tend to go up, for Liverpool has advanced her cheapest quotations from 38s. to 40s.; Havre shows a rise of Fcs. 3 in her commonest Haitians, whilst the best kinds remain unchanged, and in London a comparison of this month's prices with those in the October and September issues will show how we have advanced all along the line. To anyone having to put up a monthly series of notes like these, the continued absence of statistics from abroad, even from some of our own Colonies, makes it very difficult to accurately discuss the present position and to suggest what one can expect in the future. Nothing has come to hand for two months now from Lisbon, but M. Anthime Alleaume's, at Havre, and the Trinidad figures, continue to be received regularly. We also have had the Guayaquil receipts for each fortnight up to the end of September, excepting those for the last half of August, the absence of which spoils our total. The great point to note, however, is that, since the end of July, Ecuador, instead of far exceeding, fortnight by fortnight, what she sent down last year to the port of Guayaquil for shipment, shows by the figures given below that they are now equally far behind. The continued reduced receipts for the last three or four fortnights make one feel safe in suggesting that the receipts for the missing fortnight must run around 12,600 qtls., in which case the nine months' totals (January-September) would amount to 790,000 qtls., against 567,800 last year, 625,800 in 1912, and 633,300 in 1911. Here are the receipts for the first and second fortnights in September (these, of course, have come by mail, the cost of wiring in full being far too high, while telegrams in cipher are not accepted):—

Guayaquil Receipts—

	Sept. 1st-15th.	Sept. 15th-30th.	Jan.-Sept.
1914	13,400	11,900	*790,000 qtls.
1913	41,000	43,500	567,800 "
1912	24,100	17,500	625,800 "
1911	29,000	28,000	633,300 "
1910	26,000	29,000	559,400 "

* Estimated, as it includes the missing fortnight.]

Ecuador, of course, is given at times to store her cocoa up-country, and may have been doing so since July, hence these suddenly reduced figures. The absence of rain, or of sufficient rain, continues to trouble the West Indian islands, and Jamaica, although she is now an important item, so far as offerings on the London market are concerned, seems to have suffered as much as or more than Trinidad, which seems badly enough off. Bahia, besides her climatic troubles, whichever they are, drought or floods, is, I understand, also suffering from a complaint which has already made itself seriously felt in some portions of Europe, viz., shortness of money. So scarce is this needful commodity that some planters are said to be unable even to take the pods off the trees, much less to cure the beans and send them down to Bahia City for export. Meanwhile, superior Bahia is scarce, and likely to become more so before it becomes plentiful, and a parcel of really superior should do well now. One parcel that "might have been better" was valued at 60s., and I afterwards heard that 59s. was accepted. Some "fair" that was offered on November 10th had 53s. 6d. bid, and finally sold at 54s., whilst superior sold at 60s. to 62s. for greyish red to reddish.

Coming to stocks, these work out as under:—

<i>Havre Stock, Oct. 31st—</i>	1914. Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Accra	74,433	64 to 68	44,628	77 to 80
Bahia	16,036	63 „ 75	4,887	78 „ 85
Venezuela	93,100	70 „ 200	57,353	85 „ 200
Grenada and B.W.I.	1,699	—	2,196	—
Guayaquil... ..	51,159	70 „ 78	15,359	80 „ 86
Haiti	16,222	55 „ 70	4,063	70 „ 78
Pará	18,571	64 „ 72	11,347	80 „ 86
San Domingo	2,407	63 „ 67	8,840	75 „ 81
Trinidad	42,528	66 „ 71	22,641	85 „ 90
San Thomé	4,735	71 „ 72	3,536	84 „ 88
Divers	12,172	—	13,125	—
Totals	333,062 bags		187,975 bags	

<i>London Stock, Nov. 7th—</i>	1914. Bags.	1913. Bags.	1912. Bags.
Trinidads	8,153	11,752	7,005
Grenadas	4,784	2,813	713
Other W.I.	4,186	3,630	6,866
British W. Africa	6,587	5,354	4,754
Portuguese W. Africa	2,015	6,208	6,094
German W. Africa	1,050	3,078	9,749
Ceylon and Java ...	13,920	12,141	10,687
Guayaquil	21,261	18,644	36,374
Brazil and Bahia	3,266	2,437	3,468
Other Foreign	11,110	9,124	7,083
Totals	76,332	75,181	92,793

On November 14th the stock was 73,359 bags, against 75,547 last year.

The Board of Trade figures for the United Kingdom to the end of November are to hand and somewhat disappointing; with so many mouths to feed and the foreign manufactured article, as the figures show, cut off to a considerable degree, one cannot help hoping that they would have been better. Here are the figures:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Oct. 31st) Tons.
Jan.-Oct., 1912—	26,427	22,154	5,232	8,478
„ 1913—	29,108	23,007	5,859	9,030
„ 1914—	33,467	23,281	6,468	13,421
Incr. 4,359	Incr. 274	Incr. 609	Incr. 4,391	

In October only, 1,961 tons were delivered for home consumption, against 2,504 last year, and 1,895 in 1912.

Foreign Manufactured—Imported.	Oct. only	Del'd H.C.	Jan.—Oct.	Del'd H.C.
1914 ...	461 ...	504 ...	8,206 ...	8,138 tons
1913 ...	1,286 ...	1,498 ...	10,544 ...	10,084 ,,
1912 ...	1,272 ...	1,178 ...	8,326 ...	8,402 ,,

The full crop figures have come to hand for Trinidad and work out as follows (those for Grenada have not yet been received):—

Trinidad Crop—

Oct. 1-Sept. 30	To England	To France	To U.S.A.	Total bags
1913-14 ...	12,217 ...	143,765 ...	161,905 ...	= 317,887
1912-13 ...	17,284 ...	99,743 ...	119,155 ...	= 236,186
1911-12 ...	15,048 ...	83,638 ...	122,920 ...	= 221,606
1910-11 ...	20,028 ...	101,030 ...	130,836 ...	= 251,894
1909-10 ...	23,659 ...	139,098 ...	131,129 ...	= 293,886

I include 1909-10, as it was the previous record. Had the weather been kind to the May-September pickings, Trinidad would probably have added another 50,000 bags to her 1913-14 output. We can only hope that the crop for 1914-1915 will make up for the past six months' shortage.

Coming to business done, the sales on November 17th, showed a marked advance in values on anything hitherto paid, and with a good all-round demand; even, in fact let us say, especially for Guayaquil the competition was keen and prices went up 1s. to 2s. Jamaicas sold well, but not so well, in comparison to other growths, as she has been doing. On the basis of these auctions present values are:—

Trinidads.—Superior held for 67s. or 68s., whilst fine red marks sold 63s. and 64s., fine good red 62s., and good middling to good red 61s., middling red 60s.

Grenadas.—Fine marks sold 60s. and 61s., good red 58s. to 59s. 6d., good fair 57s. and 57s. 6d.

Dominicas.—Fine marks 58s. 6d. and 59s. 6d., good red 57s. and 57s. 6d., fair common unfermented 53s. 6d. to 54s., fair to reddish 54s. 6d. to 56s. 6d.

Jamaicas.—At the sales on 17th, common to fair common sold at 56s. to 58s., and good red is held for 60s. and over.

St. Lucias.—Good reddish to fine red 57s. to 59s. 6d.

Bahia.—Good superior 62s., rather less red 61s., good reddish 58s., fair 54s. On the basis of these sales some value the best superior marks at 64s., and the latest news from Bahia of a serious shortage of this quality, justifies them in doing so.

British West African.—Of actual sales I have but scant news. Liverpool reports a firm market, especially for spot and near parcels, with sales of African kinds at 48s. to 50s. Here in London, however, I have heard of no transactions.

San Thomé must be valued around 60s. for the best marks on the basis of Grenadas.

Java.—Bold pale sold at 79s. and 76s. for bold without shells. On November 17th fine realized 82s. 6d. and 83s.

Venezuelan.—Good red unclayed sold at 65s.

Samoa.—Good boldish realized 70s., and also 68s. to 70s. for mixed cured, but somewhat similar breaks.

Guayaquil sold up to 66s. for summer Arriba, 56s. 6d. to 57s. for Manta, 56s. to 58s. for Machala, 57s. 6d. Balao, 54s. for Tumaco. These prices are much the same as our June valuations (see June issue, p. 120), except for fine Arriba, which is now 66s., against 64s. in June. The sales on 17th added another 1s. to above.

Ceylons.—Fine sold at 80s. 6d., good medium 68s. 6d. and 69s. 6d., ordinary estate 62s. 6d., whilst common native fetched 43s.

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. X.—No. 12.]

DECEMBER, 1914.

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By the time the majority of our readers receive this number, this year of grace, 1914, with its magnificent war (magnificent on account of its extent and because of what it stands for as a crusade of right against might, and of law and order against the sword and brute force), will have passed, and a New Year taken its place. We trust, in common with everyone who does not spell culture with a "k," that long before another New Year comes round we shall have peace in the world, and employment, houses and food for all. The war, according to all accounts, is costing this country alone at least £1,000,000 a day; this being so, Germany must be spending at least three, if not four or five, times that amount, for she has all Europe around her as enemies, whilst her ability to earn money is almost *nil*, and her efforts even to feed her people will become more and more difficult.*

Our readers, therefore, when they receive this copy, will be able to gauge how matters stand and how long the war will continue. Our own people can certainly congratulate each other very heartily that the war came as it did, and has taken the turn that it has done. Possibly, at times, the men who are in the trenches wish they were at home, but if so, we, and many others who are used to "be out and about," and in whom the romance of life and of Empire building is very strong, also regret that circumstances keep us here, and do not even allow us to be accepted for active training, which is making many a youngster around us look taller, stronger, and altogether far more "fit" than we or they themselves ever dreamt of. Fighting in such a war is undoubtedly no boy's adventure, but it has its compensations, and the longer it lasts the greater will be the longings of those left behind to join in. If it were not for the "Kitchener" training many of us who can shoot could perhaps have taken our turn at the trenches for a fortnight or more, and so enabled the "real" soldier to have a rest, but as that is not the "Kitchener" way we have to be tied up at home, more confined than ever, only waiting until the final news of the march into Berlin is received. That this may be fairly soon is, we feel, therefore, the best wish that we can send forth to our readers for Christmas and the coming New Year, and so we send it, together with many others, for the health and well-being of one and all.

* In your opinion how long will this war last? Irwin Shrewsbury Cobb, the American is said to have asked Lord Kitchener during the only interview our War Lord has given since the outbreak of the war according to the *London Times*. "Not less than three years," answered K. of K. "It will end only when Germany is thoroughly defeated—not before—defeated on land and sea . . . If three years are required for the undertaking, or more than three years, the world will find that we for our part are prepared to go on, determined to go on, certain to go on. In any event the war can have but one outcome—one ultimate conclusion."

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The Cult of the Coco-nut.

PROFESSOR COPELAND'S (OF THE PHILIPPINES) BOOK.*

THE author of this book, which every coco-nut planter will greet with pleasure, is, of course, the well-known Dean of the Agricultural College at Los Baños, in the Philippines, where he is also Professor of Plant Physiology. This book, like Van Hall's work



One way to germinate Seed-nuts in the Philippines.
Nuts hung up in pairs to sprout.

on "Cacao," has been expected for some time, but has made its appearance at a very opportune moment, for it tells us of much that we have not yet seen in print, although we knew of it, or guessed that it was so. Take a random chapter (IV), on the selection and treatment of seed; the author states definitely what we have all along feared, that "there have nowhere been any prolonged experiments in the breeding of coco-nuts; there are no seedsmen who deal in coco-nuts as seedsmen do in the seed of the field, and, except the French Ministry for the Colonies, no Government has carried on a systematic study of the different varieties, races and strains. . . . The best study of the varieties of coco-nuts which has so far been made seems to me that undertaken in Madagascar by Prudhomme,† who discusses twenty apparently very distinct forms. . . . Simmonds lists thirty varieties, and Shortt names thirty for Travancore alone. Jumelle states that there are at least twenty-five varieties known in Java, and both he and Hubert also state that there are more than forty known in the Philippines; this figure, if it has any basis whatever, can only rest on the number of dialect names which it is possible to distinguish."

* "The Coco-nut," by Edward Bingham Copeland. 212 pp. 23 illustrations. Price 10s. 6d. net. Weight 24 oz. Macmillan and Co., Ltd., London, or TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, Oxford Street, London, W., being one of the Macmillan series of Handbooks on Tropical Agriculture, of which the following have already appeared: "Cacao," by Van Hall, 14s. net; "Spices," by Ridley, 8s. 6d. net; "The Cotton Plant in Egypt," by Lawrence Balls, 5s. net; "Silviculture in the Tropics," by A. F. Brown, 8s. 6d. net; and "Diseases of Tropical Plants," 8s. 6d. net. Postage extra.

† After the Congress at the Imperial Institute, which he attended, Professor Prudhomme, who is Director of the Colonial Garden at Nogent, near Paris, presented us with a copy of his book, to which we shall refer in a future issue.

Whoever is right, there is undoubtedly much to be done to improve plantation nuts by choosing the best variety or varieties and selecting the seeds to be planted from them, but in any case no chapter in Professor Copeland's book needs to be more carefully studied and followed up than this one on the selection of seed.

The treatment of the seed-nuts includes various methods of germinating the nuts which we have never yet tried. The illustrations that accompany the instructions given add much to the clearness of the descriptions of the methods in use, such as hanging up the nuts in pairs round a house (as illustrated) or elsewhere, or by stacking them round a pole to germinate; whilst the full-page illustration of a seed-bed planted with yams in the background forms in itself an excellent object-lesson for any planter to take as a model, even if he never saw the text.

Chapter III, on "Diseases and Pests," gives you much information within a small compass. If the author has had to cut his descriptions short, the names of all the plagues are there, with illustrations of the three worst, viz., the Coco-nut Scale (*Aspidiotus destructor*), the Red Beetle (*Rhyncophorus ferrugineus*), and our old friend the Rhino (*Oryctes rhinoceros*, or we hope they are, for the list on pp. 103-104 is long enough in all conscience. In Chapter V (p. 123), dealing with "Field Culture," the author criticizes recommendations hitherto given as to the best distance to plant. Bearing in mind Professor Copeland's own warning on p. 56, that "close planting is certainly favourable to the spread of the disease (bud-rot), and is to be condemned for this as well as for other reasons," he goes on to say: "Those who have written about the coco-nut have, without exception, recommended wider spacing than is often found in practice." This is, of course, correct, be-



The Ideal Coco-nut Country according to Prof. Copeland.
A Crater Lake at the foot of a Volcano.

cause they have sat up, with a perfectly impartial mind, and heard all sides of this important matter; such writers have come to the conclusion, the same as with rubber and cacao, that the close planting on large estates has not hitherto proved to be to the best interests of the estate owners, and so have recommended that fresh lands should be wider planted.

There are, however, no rules without exception, and as Dr. Van Hall pointed out in the preface to his book on "Cacao": "It is a golden rule that cultural methods must always be entirely dependent on local conditions. Generalizing is one of the most dangerous things in agriculture." A writer must more or less generalize, especially in an international book; but all the most reliable authorities are most anxious to get planters to simply look upon their recommendations as suggestions, and not to think of adopting them until they have proved which, if any, is most likely to



Coco-nuts and Rice.

Coco-nuts surrounding Paddy Fields in the Philippines.

suit their conditions better than the others. It can well happen that out of all these experiments the experience gained by watching the results may evolve a further improvement, if not a new method distinctly different from any of those tried, and which proves to be the best for the soil and conditions that prevail in that particular neighbourhood.

There is much more in this book that we could discuss, but space forbids, at any rate for this issue.

In our January number we hope to include a review of the monumental work on "Some South Indian Insects," by Mr. Bainbrigge Fletcher, R.N., F.L.S., F.E.S., F.Z.S., formerly Government Entomologist at Madras, and now the Imperial Entomologist to the Government of India. It weighs $5\frac{1}{2}$ lb., contains 565 pages (the size of TROPICAL LIFE), and includes 440 illustrations of the insects, their work, friends and enemies. The full title is "Some South Indian Insects and other Animals of Importance considered especially from an Economic Point of View." The "animals" include an interesting section on birds (illustrated) and shows crows following a harrow or cultivator, and eating the insects disturbed by the tines. The question of spraying machines and the fluids and powders to be used have a prominent position, and the harm done by the noxious insects is freely illustrated. But what an army of them and yet we are told these are only "some." The book is published by the Government Press, Madras, and costs only Rs. 6, or 9s., postage extra, say 2s.

The Utilization of Manure Waste, &c., for Tropical Crops.

THE MANURING OF TEA: A PROOF OF HOW IT PAYS.

(Continued from p. 203.)

LET us now turn to what our well-known contemporary, *The Planter's Chronicle* of Bangalore, said on this subject last October, when quoting a report of the Koilpatti Agricultural Station on eight years' experimental work with different methods of storing cattle manure. According to these notes, the methods of preserving cattle manure which have been tested are as follows:—

(1) *Box Manure*.—This is prepared by daily spreading the droppings of the cattle on the sunken floor of the cattle shed and allowing the animals to tread on the manure.

(2) *Byre Pit Manure*.—The cattle are tied in an ordinary shed with a masonry floor and the droppings are daily collected and put into a covered pit. The urine is also drained off the floor, collected and added to the solid dung in the pit.

(3) *Heap Manure*.—The cattle are kept in an ordinary shed and the solid excreta are thrown on to an exposed heap.

(4) *The Local Method*.—This was introduced into the experiment only three years ago and is similar to the above except that the dung is thrown into a shallow pit and periodically covered with a layer of black soil.

The figures in the statement* show clearly that the action of cattle manure is to a considerable extent mechanical, thus the shallower rooted cereals respond much more to those forms of cattle manure which contain most organic matter. Thus the Box manure contains (calculated dry) 56.9 per cent. of organic matter, Byre Pit manure 45.01 per cent. and ordinary Heap manure 38.87 per cent., and the table shows that the yields are greatest when most organic matter has been applied. The Heap manure, although it contains no urine, shows a much higher rate of accumulation, which averages 21.23 lb. per day compared with Box manure 15.36 lb. and Byre Pit manure 17.05 lb. Thus it contains much more foreign inorganic matter, besides which, being well weathered by exposure, it is in a much finer state of division and can therefore more readily become incorporated with the soil. That this has happened is shown by the yields of cotton obtained by the application of this manure. The Heap manure has given an annual average yield of 805½ lb. of kappas compared with only 752 lb. from Box manure and 719½ lb. from Byre Pit manure. That the cotton crop cannot make use of all the cattle manure which contains more organic matter is indicated by the yields obtained this year when fodder cholam was grown and when this crop had to depend solely on the residue of the manure applied the previous year to cotton. This year's yields of fodder cholam given in the table show that these residues are very large and in the case of cattle manure are highest where most organic matter has been applied.

The yields obtained by the application of more

* Unfortunately we cannot include the tables here, but must refer our readers to the original report, or to *The Planters' Chronicle*, for same.

concentrated fertilizers when compared with those obtained from the use of cattle manure show that in the case of the superphosphates and saltpetre, it is possible to obtain good yields of both deep and shallow rooted crops, especially as regards the straw of the latter, but we find that the cost of the manure absorbs all the profit obtained by the increased yield while the residual value of the manure as shown by this year's fodder cholam crop is very small when compared to those of cattle manure. It is possible, however, that these manures being soluble have worked their way deeper into the soil and next year's cotton crop will show whether this is the case. With regard to Neem cake, this has given very good yields from shallower rooted cereals and has given higher yields of cumbu than any other manures applied. The yields of cotton, however, have never been high and the residual value of the manure is much less than that of bulky organic manures. The "local method" cattle manure is an exception, but this has only been applied for three seasons and not for eight seasons as in other plots. It is also a well rooted manure thoroughly incorporated with the black soil which has been added in the making and therefore is likely to work down deeper into the soil and thus render the cotton crop more drought resistant. In all the other cases, the manure is much more likely to remain near the surface and this would tend to form a development of a surface root system and this during the dry weather when the bolls are swelling would be likely to account for the low percentage of lint.

Dr. Alford Nicholls of Dominica also gave some very useful advice on the building up of manure and compost heaps in his well-known handbook on *Tropical Agriculture*, when he tells us: "Farm-yard manure consists of litter trodden down by the stock and mixed with the solid and fluid excrements of the animals. It is the most valuable manure that can be put on the land, for it enriches the soil more than any other substance can do; it exerts a beneficial chemical as well as mechanical effect on the land, and no other manure is so lasting in its action. Its quality, and therefore its effect on the soil, varies greatly according to the animals producing it and the kind of food given them. Young animals use most of their food to build up their bodies, and consequently the manure from them is not so valuable as that from fully-grown ones; animals that get rich food produce much richer manure than poorly fed ones. For instance, horses fed partly on corn, oats or seed-cake give a more valuable manure than animals merely fed on grass, and in England and elsewhere cattle are often fed highly in order simply to enhance the value of their manure, and it is frequently found cheaper in the end to expend money in this way.

"When farmyard manure is put up in a heap it commences to ferment, and this is caused by the rapid growth of myriads of low vegetable organisms of the nature of moulds. This fermentation produces heat and causes important changes to take place in the manure whereby it is rendered more fit for the formation of plant food. Sometimes an odour of ammonia is easily discovered, and this shows that the heap is too dry, so that water should be thrown upon it. On the other hand when the heap is exposed and heavy rains fall on it, a stream of black liquid stuff will run out; this is very valuable and should not be

lost; it ought to be collected and poured back on the heap or on to the soil where its high fertilizing action may be useful. The liquid manure contains ammonia and other organic substances and hence its value as plant food. If possible, the dung heap should be kept under cover and then there will be no chance of heavy rains washing away its valuable substances.

"Compost is a kind of farmyard manure composed of all the animal and vegetable refuse on the estate or elsewhere that the planter can lay his hands on. Weeds, dead leaves, road and gutter scrapings, dead animals, kitchen waste, &c., are heaped up together and allowed to rot, when a valuable manure will be formed. Its value may be increased by pouring some of the liquid manure over it and by turning it sometimes so as to assist the fermentation by allowing air to enter.* The addition of a small quantity of lime stirred into a compost heap improves the quality of the manure immensely, as it assists in forming nitrate, or nitrate of potash, a very important fertilizing substance, which is too expensive, however, to be much used as an artificial manure.† It must be remembered in regard to dung and compost heaps that they must not be kept too long, for otherwise the exposure to the weather and the excessive fermentation cause a deterioration in the value of the manure as plant food.

"Again, waste products of a town or village form excellent manure, and a good planter will be very glad to obtain them, when possible, to put on his land. Blood and bones, and other refuse from slaughterhouses, decayed fish, hair, wool, rags, sawdust, sweepings, night-soil,‡ &c., are all useful to increase the fruitfulness of the soil. They should be put on the land and dug or ploughed into it, and will then well repay all the trouble and expense the planter has incurred in obtaining them."

IN spite of the war we are pleased to see that the *Samoanische Zeitung* is again being issued. The stamps on the wrappers were, we noticed, firstly the old Samoan stamps surcharged G.R.I. in black ink, now it is the New Zealand stamp with Samoa printed across in red ink. "Although," writes our contemporary, in a short editorial, "in view of the war, we informed the public that we should cease publishing after October 1st, we have been induced for several reasons to reconsider our decision. We shall have no politics, but being the only newspaper in Samoa, our columns afford interest to a large public and assist those engaged in business. This has especially prompted us to continue. We know that we have a difficult work before us, but we intend to place Samoa and her interests in the foreground." If our Samoan contemporary acts up to this, we are sure all will wish it every success as a journal.

* And especially by the addition of some chemical manures.—ED., T.L.

† Readers will also remember how, in the September issue, p. 163, we discuss the great part that the soda content of nitrate of soda plays in freeing the potash in the soil, and making it available for absorption by the growing crops; in times like these when supplies of potash are cut off this must be borne in mind. In October, p. 183, we criticized an objection stated to exist in India against nitrate of soda, and explained why such a prejudice is a great mistake.—ED., T.L.

‡ See pp. 191 and 193 in our October issue, *re* preparing night-soil for manure.

Tobacco Planting. No. XI.

AN IMPORTANT AMERICAN HANDBOOK ON TOBACCO
PLANTING AND CURING.*

WE are devoting this month to a discussion of the above book, which we were only able to "acknowledge" last month, because we feel that those of our readers who do not yet know of it will be glad to be told that it is in existence, and what it is like. The record of the authors speaks well of the experience they are able to bring to bear on the subject of which they treat very fully, and in a way, we should imagine, that only those who have a first-hand knowledge of the industry would be able to do. The book discusses the most approved methods (up to 1912, the date of publication) of growing, harvesting, curing, packing, and selling tobacco, also of tobacco manufacture, and whilst Mr. Killebrew was special expert on tobacco for the Tenth United States Census, and author of its comprehensive report on the culture and curing of tobacco, as well as of exhaustive reports on the crops and resources of that State, Mr. Myrick is the organizer of the New England Tobacco Growers' association, and these further acknowledge the help given them by various successful tobacco growers, dealers in leaf, manufacturers of tobacco, &c.

We shall be constantly referring to the book in the course of these articles, but running casually through the chapters, the ones, perhaps, that appeal to us the most are those on "Varieties" (pp. 27-45), "Science in its Application to Tobacco, dealing with Fermentation" (pp. 79-104), "Manures and Fertilizers" (pp. 105-149), "Seed-beds and Transplanting" (pp. 150-178), "Tobacco Barns and Curing" (pp. 179-208), and "Pests" (pp. 233-264). Every word in the book is worthy of attention, but to producers of other than cigar-leaf tobaccos, which are dealt with in Part II (pp. 379-451), those sections in Part I, between pp. 27 and 263, will be the first that they turn to.

The printing of the book and the reproduction of the illustrations are somewhat primitive, reminding us of our apprentice days in South America, when the appliances and the paper we used would cause our present staff to resign at once; we cannot help remarking on this, for the contents are extremely good, and we wonder why the illustrations and printing are not on a level more worthy of them.

The chapter on "Manures and Fertilizers," the preface tells us, has been prepared with extraordinary care and fulness, and we have no doubt that this is the case. Where the book is also very strong, indeed, is in those sections dealing with the marketing of the leaf. Professor William Frear, in charge of tobacco work at the Pennsylvania Experiment Station, and author of a leading treatise on the bacteriology of tobacco; Dr. E. L. Jenkins, of the Connecticut Experiment Station, and many others whose names are given, have taken a prominent part in collaborating with the authors in compiling the work. The book, of course, has been written mainly in favour of the American tobacco industry, but as others, like Uncle Sam, find the in-

creasing competition in the world's market is troubling them, they will, we are sure, be glad to hear what, apparently, the pick of Uncle Sam's school has to say. We agree with the authors that after nearly 400 years of tobacco-growing there is yet much to learn. We hope, by means of the articles running in our journal, not only to increase the planters' general knowledge, but, especially, to guide him to the latest publications on the subject, such as the present book.

Coming to the chapter on "Manures and Fertilizers," which we have carefully studied, "it is evident," we are told, "from the preceding chapter (on 'Fermentation and Curing') that the form, quantity, and quality in which food is furnished to the crop, opens up a vast field of vital importance." We are again warned, as with rubber and cacao, against the dangers of generalization. As regards manuring or feeding the soil, "no hard and fast rules can be laid down, but each planter who wishes to excel in growing fine tobacco must experiment for himself." This cannot be drummed into every planter too often, and without attention to the advice contained in this short sentence no one can expect to succeed. What the tobacco grower has to remember is that (quoting p. 109) "the plant is really 'forced,' just as market garden crops are forced, by promoting a luxuriant growth through the superabundance of fertility, kept in a state of constant availability by thorough cultivation." It is as important—perhaps more so—to remember what fertilizing ingredients you must avoid as it is to remember the best mixtures to make use of; chlorine and chlorides especially must be avoided. Whilst it has been shown (p. 120) by an analysis of the plant, and by experience in the field, that tobacco requires a large quantity of nitrogen since it does not possess the ability to get its nitrogen from the air, yet we are particularly warned (p. 110) against using coarse animal matter as green slaughterhouse waste, coarse meat scraps, &c., as these decay in a "violent" manner that creates a condition in the soil that is bad for the quality in the tobacco, for it develops a leaf with a coarse texture, large veins, and an excess of woody tissue. Nitrogen salts are held in very high esteem for all crops, but are of special value for tobacco; when properly applied nitrate of potash would, we take it, be admirably suited for tobacco (p. 134) owing to its large percentage of both nitrogen and potash, but owing to its suitability for manufacturing gunpowder, &c., it sells too high to be used as a fertilizer. Although in theory nitrate of soda should be applied little and often, yet at Poquonock the application all at once, between the rows, after cultivation, gave best results. When the war is over, and supplies of potash are again available, we should strongly recommend that experiments be carried out with nitrate of soda and potash mixed first to see what effect, if any, the soda may have on the tobacco, and whether this effect, if any, is nullified or lessened by the potash; those of our readers interested in tobacco in the full Tropics, after carefully studying all this book has to tell them, will need to carry on much of the experimental work themselves to see how they do under tropical conditions and in no department will this be more necessary than in the question of manuring.

(To be continued.)

* "Tobacco Leaf: its Culture and Cure, Marketing and Manufacture," by Killebrew and Myrick. Profusely illustrated. The Judd Co. 506 pp. Price 10s., post free 11s. 6d. TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, London, W.

Sugar-cane Growing in the Argentine.

A PERUSAL of the latest statistics concerning the production and output of sugar in the Argentine will show how far behind that country is in the matter, manner and methods of cultivation carried on out there. Granted that this industry in Argentina is a comparatively new one and that it has undoubtedly made rapid strides within recent years, there is still room for improvement. We trust, however, that the authorities will take the matter in hand and inquire into the conditions existing on the sugar plantations with a view of considering what can be done to improve them.

According to a report which appeared in the *Indian*

Trade Journal for July, 1914, the production of cane in the Tucuman district ranged from $6\frac{1}{2}$ tons per acre in a bad year to 20 tons in an exceptionally good year. In the Argentine in 1912 there were 180,000 acres under sugar, which, calculated on an average crop of 12 tons per acre (probably above the average), should have yielded some 130,000 tons (metric) sugar per annum, whereas in reality only 115,000 tons were secured, or less than two-thirds of a ton per acre per annum.

Sugar planters in other countries might do worse than take a leaf out of the book of Hawaii, the country which produces the largest quantity of sugar per acre. The cultivation of the cane in Hawaii is carried out under scientific principles and controlled



Unmanured.



Complete Manure.

Manuring Experiment on Sugar-cane conducted by L. E. Grimshaw, Cairns, Queensland, Australia.

EXPERIMENT ON SUGAR-CANE AT TUCUMAN, ARGENTINE.

Name of experimenter	No. of plot	Manuring per acre	Yield of cane per acre	Percentage of saccharose in cane	Sugar per acre	Increase due to manuring
Ingenio "San Pablo," Nougues Hnos., Colonia Zavaleta, Tablon 2	1	First application { Sulphate of potash 2 cwt. Basic slag .. $3\frac{1}{2}$ "	21 tons 18 cwt.	12.62	2 tons 15 cwt.	9 cwt.
	2	Second application { Superphosphate .. $1\frac{1}{4}$ " Sulphate of ammonia $1\frac{1}{2}$ "				
Ingenio "San Ralos," F.C.C.N. Avelanada and Teran. Administrador, Ismael Sosa, Colonia, Cornelia Diaz, Süd, Tablon 1	1	First application { Sulphate of potash 2 cwt. Basic slag .. $3\frac{1}{2}$ "	21 tons 13 cwt.	—	2 tons 14 cwt.	7 cwt.
	2	Second application { Superphosphate .. $1\frac{1}{4}$ " Sulphate of ammonia $1\frac{1}{2}$ "				
Ingenio "Santa Lucia," Administrador, Elwart, Lerco D., Tablon 2	1	First application { Sulphate of potash 2 cwt. Basic slag .. $3\frac{1}{2}$ "	22 tons 0 cwt.	12.0	2 tons 13 cwt.	10 cwt.
	2	Second application { Superphosphate .. $1\frac{1}{4}$ " Sulphate of ammonia 2 "				
Ingenio "San Pablo," Nougues Hnos., Lerco 6, Tablon 1	1	First application { Sulphate of potash 2 cwt. Basic slag .. $3\frac{1}{2}$ "	23 tons 6 cwt.	15.55	3 tons 12 cwt.	12 cwt.
	2	Second application { Superphosphate .. $1\frac{1}{4}$ " Sulphate of ammonia 2 "				
	2	Unmanured	18 tons 5 cwt.	12.41	2 tons 6 cwt.	—
	2	Unmanured	18 tons 13 cwt.	—	2 tons 7 cwt.	—
	2	Unmanured	17 tons 4 cwt.	12.5	2 tons 3 cwt.	—
	2	Unmanured	19 tons 17 cwt	15.18	3 tons 0 cwt.	—

by the Sugar Planters' Association, which possesses a highly qualified staff of scientists working at their experiment station, where experiments are conducted on various lines.

The manuring of the cane fields is a very important item in the work of the staff, and many experiments are carried out with a view of informing the planters which fertilizer mixtures are best and most suitable for application to their fields, and there is but little doubt that the question of profit or loss in cane-growing depends largely, perhaps mainly, upon an intelligent choice of fertilizers and the manner of applying them to the stools and soil generally.

The Hawaiian soils and conditions are so diversified that a manure mixture which suits one portion of the estate may be quite unsuitable for another or for any other district in the country, but as the Experiment Station carefully investigates the requirements of each planter every one is certain of getting the correct formula and therefore of obtaining the utmost return from his soil.*

Recent experiments conducted in various parts of Hawaii have shown that plant-cane from an unmanured field will yield from 25 to 30 tons of cane per acre, whilst by judicious manuring these figures reach as high as 40 to 42 tons per acre, and 5 to 6½ tons of sugar per acre were obtained from the completely manured plots against 3 to 4½ tons where unmanured.

As will be seen from the annexed table, which represents results from various experiments carried out in Tucuman, Argentina, the average yield of cane from an unmanured field was only 18½ tons per acre, which yielded 2 tons 9 cwt. sugar, whilst the completely manured field yielded 22 tons 4 cwt. cane, giving 2 tons 18 cwt. sugar. The average profit by the use of manures in this case (based, be it remembered, on the prices ruling before the war) amounted to about £5 17s. per acre, not a large sum by any means, but sufficient to show what good cultivation and manuring can do for the planter, and it is to the interest of every planter in the Argentine to follow

the lead set by the Hawaiian planters and do for themselves what others have done for the estates in the American colony.

Regarding the question of which fertilizers should be used, it is a well-known fact that nitrogen and potash should be the dominant constituents of a mixture for sugar-cane, whilst phosphoric acid takes a secondary, but none the less essential, place. It would be invidious to suggest any mixture in this article because the soil and the climatic and other conditions must be taken into account. Planters, however, would do well to communicate with the experts in their own district, or carry out experiments themselves, with a view of bringing the Argentine more into line with Hawaii and the other sugar-producing countries that are doing better than they

are, especially now that they are obtaining probably double the price for their sugars and so can afford the money necessary to carry out the experiments.

Where Rubber is Used. No. 8.



No. 8.—Entrance Hall of the Karsino, Hampton Court; flooring laid with rubber tiling made by the North British Rubber Co., Ltd., Edinburgh.

THIS year's Christmas Number of *Truth* is chiefly devoted to the war. The topic of the moment is illustrated in two large coloured cartoons by Mr. Stanger Pritchard and Mr. Roland Hill ("Rip"). Under the title "The War Lord," Mr. Pritchard has produced a fine imaginative picture of the horrors

of war, in which the gigantic War Lord drives before him the terror-stricken population flying from the battlefield, while the burning cathedral of Rheims illuminates the background. "Rip's" picture strikes a different note, illustrating with highly comic effect a police-court scene of a "Charge of Hooliganism," in which the two Kaisers and the German Crown Prince are placed in the dock before a bench of neutral sovereigns, with the President of the United States in the chair. A humorous newspaper report of the proceedings appears in the text of the number.

The number concludes, in a seasonable key, with a Russian Christmas tale, and a humorous "Interview with Father Christmas," who gives his views on the war in the neighbourhood of the South Pole, where he has temporarily taken refuge; an illustration shows the old fellow being strangled by the Kaiser.

* This is exactly what we told our friends at the Rubber Congress in June at the conclusion of our paper on the "Manuring of Rubber," see *TROPICAL LIFE* for September, p. 173.

Cacao Cultivation. No. XXXIV.

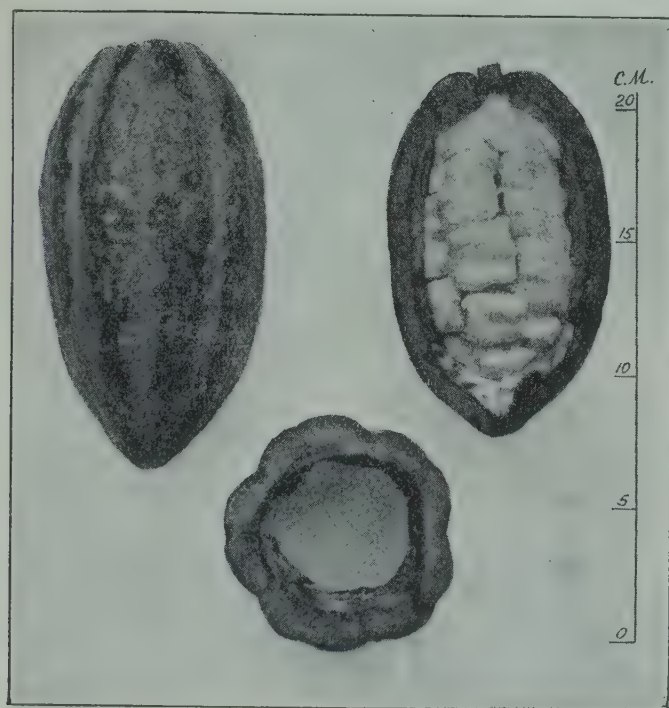
DR. VAN HALL'S BOOK ON CACAO.*

WHEN the history of agriculture comes to be written, the volumes in it devoted to Tropical Agriculture will contain a prominent section devoted to cacao, and here we shall, or should, find a long list of names of those



Venezuelan Sambito (=Amelonado) with large seeds.

who have devoted much time to the cultivation of the trees, improving the stock, introducing new methods for preparing the beans, and last, but not least, in fighting the pests and diseases that beset and threaten the trees. In the same way that Sir Patrick Manson,

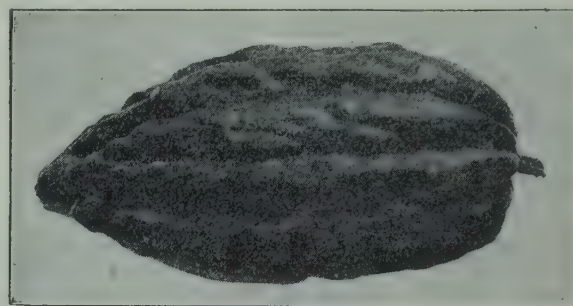


Surinam Amelonado.

Sir Ronald Ross, and others have striven to help, and succeeded in helping man to avoid or overcome trouble and danger from diseases and disease spreading insects, so have Went, Van Hall, &c., for Holland;

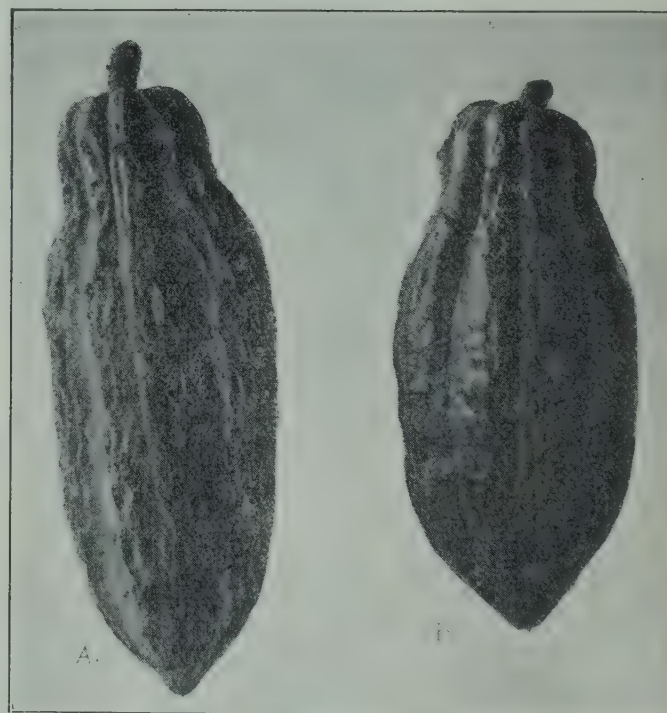
Bamber, Lock, Petch, Hart, &c., for England; Preuss, Fickendey, and others for Germany, done for cacao and other trees in the vegetable world. No one interested in tropical medicine or agriculture can forget what the men named above have done to drive away disease when it arises, or, better still, prevent its coming to spread trouble around in the first place.

This being so, when the late Dr. Pehr Olsson-Seffer told us that Dr. Van Hall had been commissioned by Messrs. Macmillan to write the book on "Cacao" for their series of hand-books on "Tropical Agricultural



Java Forastero, Angoleta variety.

Industries," we were very glad to hear it, for with his own experience, coupled with the close personal investigations he has carried out in connection with the witch broom disease on cacao trees in Surinam, and his knowledge of the various tongues, English, French, Dutch, and German, in which the most important modern pamphlets and books on cacao have been written (especially Preuss's "Expedition in Central and South America") we knew that we should get a good book, with much data hitherto unpublished, and



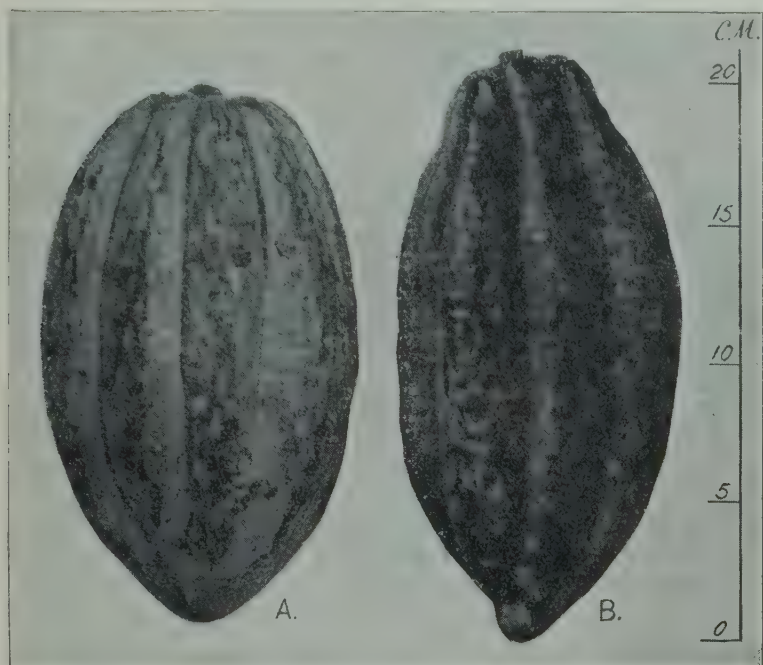
Forastero, Cundeamor variety.

The pod B. is more like Amelonado than pod A.

comparisons by a reliable critic on what others have had to say on the various methods employed, and results obtained by others as well as by himself. This is what we looked forward to receiving, and the book just to hand has not proved disappointing. If you ask us what is the keynote or text of Dr. Van Hall's

* Macmillan and Co., Ltd., London; or TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, Oxford Street, London, W. 515 pages, 140 illustrations. Price 14s. net, weight nearly 48 oz.

teaching, we would say, the following sentence in his preface: "Many planting operations are not always well understood; often the practical man knows *how* he has to treat his trees or his soil in order to get the best results, but not *why*. For this reason, different operations like weeding, shading, manuring, and fermenting have been explained more fully in this book



Forastero, Amelonado variety.

than is done in most of the agricultural handbooks. . . . It is a golden rule that cultural methods must always be entirely dependent on local conditions. Generalizing is one of the most dangerous things in agriculture. I have, therefore, devoted a special chapter to describing the cultural methods of cacao in the different countries separately." This special chapter is No. IX, p. 289 *et seq.*, in which some of the fifty different producing centres are discussed and compared in a very striking manner. The information given, *re* Ecuador, is seldom obtainable; we, at any rate, are very glad to have access to it, for the cacao industry in that Republic is a closed book to most of us, and the illustrations included add to the interest of the text. Some time back *La Hacienda*, our Buffalo (U.S.A.) contemporary, had an excellent series of articles on "Cacao-planting in Ecuador," which (as is always the case with this paper) contained some very fine photographs; we notice that Dr. Van Hall has been fortunate enough to secure the loan of several of these, especially the one shown on p. 296, of the Ecuadorian system of planting one tree in each hole, and of allowing the shoot at the foot to grow. "Many estates in Ecuador," the author tells us "seem very strange to those who are familiar with the way in which cacao* is cultivated in other countries." Preuss noticed this, for he says: "The plantations in Ecuador, however, are forests and partly even bush." Many planters, however, have now begun to use modern methods of planting and cultivation, and there are some very beautiful plantations, especially some of those belonging to Mr. Seminario† in Arriba, and

the Morla family's estate in Balao." Haiti and San Domingo are also centres about which far too little is known, especially San Domingo, the Spanish and larger portion of the Hispaniola of the days of Columbus, which is now an important producing centre, having shown a considerable spurt forward of late years, especially since 1904. Dr. Van Hall also calls attention to the difficulty of getting information about this island, although the earliest of all centres to start the cultivation of cacao. Through the kind help of Mr. Boom, the Assistant Superintendent of the Dutch mail steamers there, he is, however, able to give us a good deal of data. In the section on Trinidad the author freely acknowledges his indebtedness to Olivieri's little-known work on "Cacao"; we are glad to see this, for the book is an important one, and should be republished in London and properly printed and illustrated. As it is now its valuable contents are "drowned" in the primitive manner in which the book has been published. Manager to the large estates belonging to Mr. Gordon-Gordon, a well-known, hard-headed Scotchman, who has a troublesome knack of "spotting" slackers and incompetent men, the fact that Mr. Olivieri has remained manager to so exacting a master, is proof enough that any book he writes on cocoa-planting must be worthy of attention; Olivieri is, I believe, the only actual planter who has written a book on the subject, and especially so exhaustive a work as his. Coming to his own domain, Dr. Van Hall discusses, with illustrations, Java and her methods, compared with those used by Ceylon, whose cacao is, of course, very similar to Java and Samoa. All three of these kinds tend to become rapidly hybridized, and whilst retaining the thin, detached skin or shell and the plump roundness of the Criollo variety, the break of the beans is darker than before;



Forastero, Calabacillo variety.
(Note the measure in centimetres.)

and the "old red" colour threatens to become a thing of the past, owing to darkening effects of the "forastero" strain that has crept in to stay.

(To be continued.)

[Next month we shall compare what Dr. Van Hall has to say on "Cacao Fermentation" with the opinions of the various essayists in our book on the subject.]

* Dr. Van Hall spells it "cocoa" throughout.

† Probably the best known of all the planters in Ecuador.



"Tropical Life" Friend.—No. 114

MR. JAMES BIRCH RORER.

Mycologist, Department of Agriculture, Trinidad, W.I.

MR. RORER's name first came up prominently before our notice—"hit us in the face," we fancy the Americans would say—when he came to Trinidad in 1909, as Mycologist to the Board of Agriculture.

In connection with this work the two most important things, from a scientific standpoint, that "Our Friend" had accomplished up to the time that we last heard from him (last June) were in connection with (1) cacao canker, and (2) froghoppers and the muscardine fungus. With regard to the first, he proved that cacao canker and black pod rot are both caused by the same fungus, viz., *Phytophthora faberi*; and his report on this work appeared in April and July, 1910. In the fall of the same year Mr. Petch, working independently in Ceylon, published a paper concurring with "Our Friend's" report, and last year (1913) Mr. Rutgers in Java and Kuijper in Surinam both came to the same conclusions as those advanced by Mr. Rorer in his report. As a result of these investigations the treatment of cacao canker has been put on a sounder basis, we consider, than was possible before, for "Our Friend" has shown that the infected pods are the main source of infection of the tree, and, therefore, if the pods are protected from, or cured of the evil, by means of effective spraying, the trees are, in their turn, also protected from canker infection. Both makers and users of spraying machines should take note of this, for the report confirms all that the late Mr. Hinchley Hart used to drum into us, year in, year out: "When trouble is in the air, even miles off, start spraying; make it your maxim to spray *before* the trouble attacks your trees, do not wait until it is there." We believe that everywhere in Trinidad where the Agricultural Society or Mr. Rorer has had a word to say, spraying experiments have been carried out during the past four years with the result, always the same, that not only has the percentage of black pods been reduced, but the total number of pods per tree can be (and has been) materially increased by the use of Bordeaux mixture. "There is only one thing we want to make sure of," urged Mr. Rorer once, "we want to find the absolutely perfect spraying machine for cacao estates. What constitutes such a machine I do not pretend to say, but

when we do find it the favourable results of spraying will be even more pronounced than they have been up to now, satisfactory as they have been when carried out in a careful and scientific manner." Coming to the second item, this concerned the use of the green muscardine fungus in the sugar-cane fields as a means of combating the froghopper pest, which, it will be remembered, during the last ten years has done so much harm, and caused great loss to the cane farmers and estate owners of late, in spite of much expert advice and energy having been expended in trying to combat it. Early in 1910, however, Mr. Rorer suggested the use of a parasitic fungus, which was apparently endemic in the island (Trinidad), and designed the so-called "culture cabinets" for propagating the fungus in large quantities, and Dr. Gough, who came later on in that year, after studying the question from all points of view, agreed with "Our Friend" that the use of the fungus seemed to be the most practical and certain means of controlling the pest, and since then many of the estates have taken up the work of growing the fungus in large quantities. As a result its use in 1912 and 1913 points to the fact that it is quite a practical and feasible way of combating the pest, especially if the weather conditions favour the planter. This fungus, by the way, is, according to Mr. Rorer, the same that Dr. Friederichs has used so successfully in Samoa to control the coco-nut beetle; coco-nut planters in Trinidad, therefore, can make as good use of it as the cane planters have apparently done. Mr. O. W. Barrett also reports that it is to be met with in the Philippines, so there it can do good work as well.

To render himself eligible for such work the mycologist or entomologist needs a good master. This Mr. Rorer can claim to have had, for he was working for three years with Dr. Erwin F. Smith, the well-known authority on bacterial diseases of plants, with whom Mr. John R. Johnston travelled and worked when studying the bud-rot disease in coco-nuts at Baracoa, in Cuba, in 1904. Mr. Rorer was also a member of that expedition, and the trip gave him his first insight into the mystery of the Tropics and the ceaseless activities in the way of life and movement to be found there on all sides. The work done on this journey of investigation showed conclusively that the bud-rot disease, at any rate as it occurs in Cuba, is of bacterial origin.*

Previous to this "Our Friend," who, like Mr. O. W. Barrett, is a citizen of the United States, had received his preliminary mycological training at Harvard University, where, after graduation, he was appointed Assistant in the Botanical Laboratories for three years. Later, in July, 1902, he passed the Civil Service examination for a position as Scientific Assistant in the U.S. Department of Agriculture, and began work there in September of the same year. In April, 1908, he was appointed Assistant Pathologist and transferred to the office of fruit disease investigation, where for the next three years he devoted himself to studying the diseases of the apple and peach and methods for their control, in which work he was associated with Mr. W. M. Scott, when they made the important discovery of the cause of apple blotch and the way to prevent it, and by doing so it has put many million dollars into the pockets of apple growers in the United States.

* See our book, "Coco-nuts—the Consols of the East," second edition (price 13s. 6d., post free), p. 230 *et seq.*

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8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

DECEMBER, 1914.

Wild Rubber: What is the matter with it?

THE AFRICAN CASE—ACCORDING TO CHRISTY.

"THE African rubber situation," wrote Cuthbert Christy in June, 1911,* pp. v and vi, "is undoubtedly a serious one. An impartial investigation on the spot will lead to the conviction that the prosperity of this industry in the future must be largely dependent upon the planting industry. If the trade is to depend upon the wild rubber there is little chance of its survival. Having spent five years in East Africa and Uganda, . . . I am in a position, not only to make comparisons between the species, Hevea and Funtumia, but to speak with some confidence upon the best methods of cultivation, and of collecting and preparing the rubber."

Critics of Dr. Christy maintain that he has been wrong in so persistently urging the cultivation of the Funtumia tree in Africa instead of the Hevea. We are not in a position to say whether it is Dr. Christy who is right or his critics, all we know is that Funtumia rubber seems unable to compete with other rubbers obtained outside Africa, but whether Hevea planted in the Funtumia zone has done any better we are equally unprepared to say. Dr. Christy spoke up well for Hevea and anyone interested in planting this rubber in Africa will do well to study what he says.†

The author of "The African Rubber Industry" decidedly tells us that he has "no intention whatever of asserting that the Funtumia tree is a better plantation rubber tree than the Hevea, for the good reason that

individual heveas give a larger annual yield than Funtumia. Hevea will grow luxuriantly in both West Africa and Uganda, and at several places on the west coast I have seen trees equal in size to trees of the same age in Ceylon



FIG. 1.—Cacao Oil-palm; Hevea in the foreground.

as far as I can judge." What the Hevea planter in West Africa has yet to prove, as a fact, is that, year in, year out, his trees will yield more largely and more



FIG. 2.—Canker on a Funtumia Tree.

* See Preface of "The African Rubber Industry."

† As on p. 95 in the above book, when the author is pitting Funtumia against Hevea.

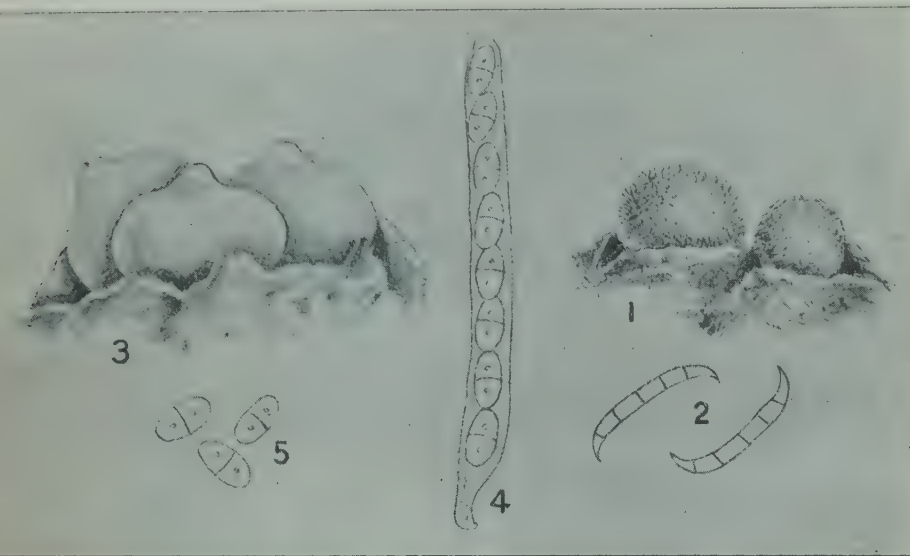


FIG. 3.—Fruit of *Nectria funtumia*. (Canker.)

reliably than their rival; every planter must place this doubt beyond dispute, at the same time noting what the increased yield and its net profit works out at. Unless it is avoidable by cultivation, the African climate is reported to cause the cortex to assume a hard, cracked and corky nature of some thickness, so one wonders if this can be prevented, for no bark that deserves the term "corky," can be expected to yield well. Perhaps now, three years after Dr. Christy stated these opinions, experience has overcome the tendency, and has now enabled the planter to produce a smooth, latex-yielding Hevea bark like the East.

Regarding yields, p. 129 says, "In Hevea, the laticiferous tubes in the bark ramify and anastomose in all directions and repair takes place from all sides. The lower edge of a transverse or diagonal cut remains moist and alive if the growth of the tree is normal; it is only necessary to pare it, or even scrape it, forty-eight hours or longer afterwards to obtain a fresh supply of latex; the irritation of the frequent paring even sets up

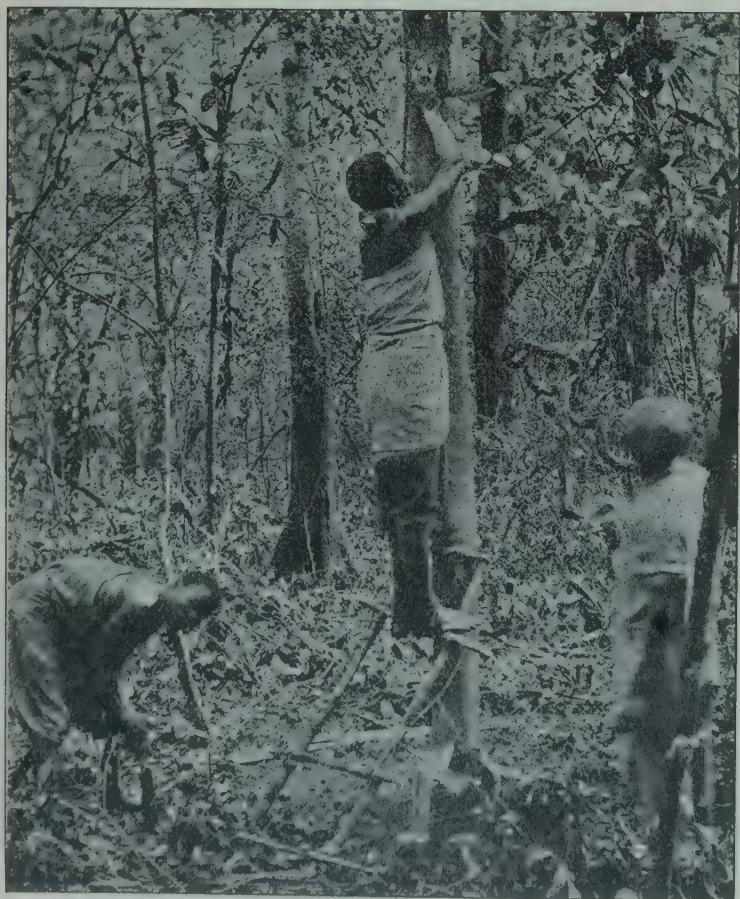


FIG. 4.—Whitewashing to prevent canker.

an obscure form of congestion, and an increased flow of latex to the spot ('wound response'). A knowledge of this so-called wound response, and the attempt to take advantage of it, is the basis of repetitional bark-stripping methods. . . . A Funtumia tree cannot be tapped frequently day after day, as in the case of Hevea and other rubber trees, but will yield a considerable quantity of milk at one tapping." This latter statement is no doubt true, but the resultant rubber from the one or two tappings of the Funtumia tree is, from all accounts, behind that obtained from the Hevea, but whether it is more or less the solid fact remains that no one, up to the present, seems to find that it pays to plant Funtumia. We believe that we are right in saying that it does not pay for long, especially at present prices, to exploit it as a forest tree.

Reading this book carefully, therefore, one is compelled to conclude that the author proves, or maintains that he proves, the superiority of Funtumia over Hevea as a plantation rubber tree for Africa, after having solemnly warned us in the words quoted at the beginning of these notes, that "the prosperity of the African rubber industry in the future must be largely dependent upon the planting industry." All we can say to this is that if Hevea has proved less satisfactory than Funtumia, the last has not proved sufficiently profitable to attract the general planter and those who have tried it condemn it without exception so far as we know. The only authority who has so far championed the plantation industry is Christy, and when he backs up his opinion, as he has done, by publishing a book that is already a classic on the subject and is likely to remain so for all time, so far as a careful and systematic investigation of the two rubbers (and also other African rubbers) are concerned, those who do not wish to see the rubber industry completely die out in Africa would be well advised to carry on the study, and continue the investigations and experiments where Dr. Christy left off in 1911, and if they can prove that Hevea can do well in Africa, and be grown to pay at normal prices, we shall be among the first to congratulate them.

(To be continued.)

The Brazilian case will follow in our January and February issues.

MR. A. H. MILNE, C.M.G., has issued a timely and very interesting life of the late Sir Alfred Jones, a good friend of this Journal, and one who, in the past, was always ready to give the Editor any assistance to secure correct information. There are a dozen full-paged plates, including one of Sir Alfred taken after he was knighted and one of him at the age of 40. Another illustration is of Oaklands, at Aigburth, near Liverpool, which we visited in 1907, at the time of the Liverpool Exhibition of Tropical Products, and of which we included two photographs in our October issue of that year. The book shows what a man blessed with energy and a big bump of persistency of object and effort can do; for this reason and as an account of how our overseas trade has been, and can be, built up in West Africa, in the West Indies, and elsewhere, this life of one of our captains of industry should be widely read. Strongly bound in cloth, its cost is low, only half-a-crown, plus another sixpence for postage. Messrs. Henry Young and Sons, Ltd., 12, South Castle Street, Liverpool, are the publishers.

The Scarcity of Acetic Acid.

CAN IT BE MADE FROM COCO-NUT MILK, CACAO VINEGAR, &c.?

READERS of our book, "Coco-nuts, the Consols of the East," will remember that we devoted a considerable space to discussing possible uses to which the milk in the coco-nut could be put instead of allowing it to be wasted and even of becoming, in the aggregate on large estates, an actual nuisance. The shortage of acetic acid on rubber estates caused by the stopping of supplies from Germany has caused the Ceylon papers to discuss the possibility of preparing the acid from the milk, or from the vinegary juice of cacao. It is also claimed that acetic acid can be obtained from coco-nut husks and fibre, &c., of which, of course, hundreds and thousands of tons are available. We trust that the investigations and experiments to be carried out will lead to tangible results, for, of course, the acid is badly needed; the latest news, if contradictory, points to there being little or no acid in the milk.

We understand that Mr. L. E. Campbell, the Acting Government Chemist in Ceylon has been carrying out some experiments at Peradeniya to see what raw materials were available locally from which acetic acid could be distilled. "Briefly put," said the *Ceylon Observer*, criticizing the experiments, "it may be said that crude acid for coagulating purposes can be obtained by the distillation of coco-nut shells, which seem to be the best material to use in view of their compactness and dryness, and a fairly pale rubber has been produced by this product. Toddy vinegar has also been used successfully, though the cost appears to be high and the process of coagulating slow. Mention is, however, made of this acid merely to indicate a source of supply in cases of emergency. Details were given of the method to be adopted, and of the apparatus used, which should apparently be within the scope of any mechanically inclined superintendent to construct. Other sources of possible supply are under investigation, and there seems little cause for fear that Ceylon could not 'carry on' even if imported supplies were to cease for ever. In such an event we may be sure more suitable methods of production would be evolved. Woods, of course, are largely used for the distillation of such acids, and Mr. Kelway Bamber, we believe, has for long considered

and supported the idea of obtaining supplies from the woods of the North Central and similar Provinces. This doubtless will also be investigated by the Peradeniya scientific staff very closely, in view of the present position. It must, of course, be understood that the acids mentioned are by no means ideal, and their use may have objections; but from what is made clear to-day there are definitely certain sources of supply which can be utilized, and successfully so should circumstances necessitate. As to the cost, it will be seen that rough estimates place it at 0.83 cents per lb. of rubber for toddy vinegar and less than 0.8 cents (100 cents = Rupee = 1s. 4d.) from coco-nut shells." The article throughout should be read by all interested in the subject and rubber planters in particular.

According to Mr. Campbell's report, which is dated Peradeniya, September 21st, if wood is used it is left for some considerable time to dry; hard woods are more suitable than soft. The best material to use from the point of view of compactness and dryness seemed to be coco-nut shell, and this has yielded very satisfactory results.

The process consists in distilling, without water, a quantity of dry coco-nut shells in a closed retort—the condenser tube taking the form of a metal coil immersed in a barrel of running water. No part of the apparatus should be of copper, as there would be a danger of traces of this metal finding their way into the acid, possibly giving rise to tackiness in the rubber. The retort may take the form of a cast

or rolled iron pipe of suitable dimensions or else of some form of boiler-shaped retort. The size will, of course, vary according to the quantity of acid required.

Yields obtained can only be given provisionally, being obtained with the small plant at Peradeniya on small quantities of material; they should, however, afford useful indications of the yields which could be obtained on a larger scale.

From 10 lb. dry coco-nut shell there were obtained about $\frac{1}{2}$ lb. tar and $2\frac{1}{2}$ lb. to 3 lb. crude pyroligneous acid, containing about 12 per cent. acetic acid.

The production of crude acid from coco-nut shells should cost very much less than 0.8 cents per lb. of rubber. There appear to be no figures enabling one to estimate the total amount of toddy vinegar now produced in the island. Rubber prepared with coco-nut water is reported to have had a better colour than rubber coagulated with the liquid from fermenting cacao.

For the War. No. 6.

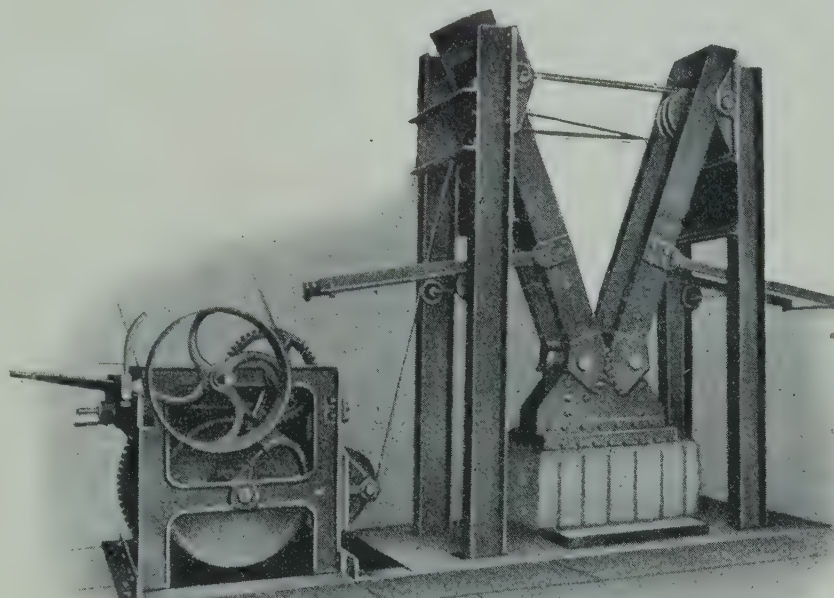


Illustration of a Press supplied by Messrs. Shirliff Bros., of Hampton Hill, Middlesex, for packing Army blankets and clothing. Similar presses supplied with boxes are baling the cuttings of khaki from the factories where the soldiers' suits are being made. Six of these machines have been supplied to firms in London for Army work, and fifteen more are in hand to follow those already in use, including eight for the Port of London Authority for baling soldiers' "comforts."

Economic Zoology.

Our Motto: "Utilization not Extermination."

THE PRESERVATION OF EGGS.

WE have on several occasions called attention to the increasing demands for poultry and eggs over here, as compared with decreasing supplies, at the same time urging our readers to take to poultry farming as a side line. The following table, taken from the *Indian Trade Journal*, Calcutta (pp. 496, 497), shows how long eggs will keep if the proper method for preserving them is used, whilst as to the ability to ship the birds there has never been any doubt.

Experiments in the preservation of eggs, said to be based on certain German Governmental investigations, tend to indicate that the three best methods of preserving eggs are with vaseline, water-glass and lime solution. Four hundred eggs were kept from July 1st to February 28th (eight months) by twenty different methods. The results are tabulated at the foot of this column.

To show how dependent the United Kingdom is on outside countries for her food supplies we quote the following from a letter by Mr. J. L. Green, Secretary of the Rural League, that appeared in the *London Daily Telegraph*, to show what a market there is in this country for meat, poultry, eggs, &c., a large portion of which, we maintain, could be produced at a profit in the Tropics; *en passant* one is obliged to wonder what proportion of this 5¼ millions sterling of butter ever saw a cow, and if it pays to make coco-nut butter in Europe *after* paying the freight on the copra, how much larger would the profit be if the butter only was shipped and the poonac fed to the local cattle, pigs and poultry, or used as manure. This is what Mr. Green tells us: "I have made an examination of the latest

official information to find out the value of certain foods received in this country annually from Russia, France, Belgium, Germany, and Austria-Hungary, and I append the result:—

Meat	..	..	..	..	£688,430
Poultry	..	..	..	..	628,898
Butter	..	..	..	..	5,228,415
Cheese	..	..	..	..	58,281
Eggs	..	..	..	..	4,916,764
Fruit (raw)	..	..	..	..	1,083,668
Vegetables (raw)	..	..	..	..	810,486
Wheat	..	..	..	..	4,076,051
Wheat meal and flour	..	..	..	..	477,045

£17,968,038

"As a fact, the loss of these imports by no means represents the total loss. Even if we regard them as surplus goods, it is clear that neither Belgium, France, nor Germany will be able to produce next year sufficient for the ordinary needs of their own population; whilst, if the war is at all prolonged, they will probably be confronted with famine. Much of this year's harvest in Belgium, Northern France, and Russian Poland has been destroyed, existing stocks of food have been confiscated by the Germans wherever they could be obtained for their troops, and the land is laid bare."

Bovril for the War.—No. 7.

In an interesting interview, reported in the *Portsmouth Evening News*, Gunner F. J. Shoebridge, one of the "Hogue" survivors, stated that just as the order came to lower boats the vessel was struck by two torpedoes, one immediately after the other. After he had clambered over the rolling chock into the water, a man caught hold of him and pulled him down. The man let him go, and some time afterwards Shoebridge was pulled into a launch. They went alongside H.M.S. "Lowestoft," but, seeing a submarine coming up, they shouted out to the Commodore, "Let us drift; there's a submarine ahead." With that the "Lowestoft" shaped a course and got clear. When later the "Lowestoft" came round again and took them aboard, they were given hot Bovril, and the marines aboard gave them any old clothes they could find.

crease the output until they have a surplus to send over here.

Method	Per cent. good
(1) Preserved in salt water	0
(2) Wrapped in paper	20
(3) Preserved in solution salicylic acid and glycerine ...	20
(4) Rubbed with salt	30
(5) Packed in bran	30
(6) Coated with paraffin	30
(7) Varnished with solution of salicylic acid and glycerine	30
(8) Dipping in boiling water for 15 seconds	50
(9) Coated with alum solution	50
(10) Kept in solution salicylic acid	50
(11) Varnished with water-glass	60
(12) Varnished with collodion	60
(13) Covered with lac	60
(14) Varnished with sward	80
(15) Packed in unleached wood ashes	80
(16) Treated with boric acid and water-glass	80
(17) Treated with potassium permanganate	80
(18) Varnished with vaseline	100
(19) Immersed in lime water	100
(20) Immersed in water-glass solution	100

THE Ceylon papers just to hand show, we were glad to see, that the Exhibition, as well as the Congress, was held in Batavia. The Exhibition was opened on October 15th, and closed on November 19th. The reports show that a considerable quantity of machinery was included, as well as the various "estate supplies" generally needed on a modern rubber plantation, including a filter for supplying water to factories. We trust that many of these invaluable but unappreciated appliances were ordered, for, as has often been pointed out in this Journal and elsewhere, much rubber is unnecessarily discoloured and the value reduced on account of the dirty water used. The experimental plant made by Messrs. David Bridge and Co., Ltd., was in great demand.

THE LONDON PRODUCE MARKETS.

FINANCE AND INDUSTRY.

OWING to the Christmas holidays we are going to press a week earlier than usual, so that the dates in this section mainly cover the first week only of December, and this being so, it is interesting to note that December 5th saw the following paragraph, as a start for some notes on the financial position, published by the *Daily Telegraph*:—

“With the huge amount of £167,970,000 to the credit of the ‘other deposits’ in the Bank of England, it is no surprise that short loans are almost unobtainable . . . but it has still to be seen to what extent supplies of money will be mopped up by the War Loan . . . though even that is not expected to produce much effect on money rates. At one time there was some rather confident talk about the Stock Exchange being reopened, but this event is not now generally anticipated.”

Those who do business with Mexico should note that the Mexican Legation has issued a warning through the press that the 1913 Loan was illegal, and that the scrips and bonds connected with the same are not legal tender and are therefore without value.

The Bank Rate remains at 5 per cent. and the old Consols are still quoted 68½ per cent., in spite of the new War Loan, which was over subscribed. The following, according to the *Public Ledger* of December 5th, is a comparison of the principal points at the present time and in the corresponding week last year:—

	Present	Last Year
Bank Bullion	£71,409,677	£36,324,187
Reserve of Notes	53,320,700	24,860,270
Private Securities	113,121,447	27,944,863
Notes in Circulation	35,926,730	28,789,800
Rate of Discount	5 per cent.	5 per cent.
Price of 2½ per cent. Consols ...	68½	72½d.
Price of Bar Silver	23d.	27d.

The produce markets have exhibited a cheerful tone, but the volume of business generally has been of moderate dimensions, the absence of any important war news not tending to stimulate operations; prices, however, have been well maintained and here and there some advances can be recorded, especially with cacao, and to a lesser degree copra. Meanwhile, housewives are noting that the prices of all foodstuffs are going up. Tea, of course, is 3d. per lb. dearer on account of the duty, but bread, sugar, butter, and the other prime necessities of life are also up, and not always fairly in proportion to the wholesale cost or value of the raw material.

Coming now to produce market news generally, we have gathered together the following particulars:—

The India-rubber Market.

CAN BRAZIL, AT PRESENT PRICES, SATISFY THE RUBBER HUNGER CAUSED BY THE ENGLISH PROHIBITION?

Public sales have still to be started, but there is no going slack on that account. Although the market in some points tends to go rather irregularly, the good demand for plantation kinds has caused that grade to advance, whilst it is reported that the Brazilian

rival, after an upward turn, closes rather easier. Meanwhile returns show that the imports of plantation kinds for the eleven months, January-November, amounted to the following (in tons):—

	Imported		Delivered		Stock
	1914	1913	1914	1913	Nov. 30th 1913
Jan.-Nov. ..	37,749	29,202	37,296	27,671	3,675
— Dec. ..	—	31,937	—	30,652	3,581

Speaking of the market generally, the *Public Ledger* tells us that plantation kinds at the beginning of the month displayed more firmness, although some daily fluctuations have occurred, prices closing steady and rather below the best of the week. A good demand has prevailed, notwithstanding the prohibition of shipping, and sales of good extent have been made. Supplies available are limited, and rubber is coming to hand slowly owing to the congestion in the Port of London due to the considerable difficulties experienced in handling fresh arrivals and to the shortage of skilled labour.* Standard No. 1 Crêpe on the spot and December delivery sold up to 2s. 2½d. and down to 2s. 2d., and buyers, January (1915) at 2s. 2d. to 2s. 1½d. and buyers, February at 2s. 2d. to 2s. 1½d. and buyers, January-March up to 2s. 2d. and down to 2s. 1½d. and buyers, and January-June at 2s. 1½d. to 2s. 1½d. and sellers. Smoked Sheet (ribbed) on the spot and December delivery sold at 2s. 4½d. to 2s. 5½d. and sellers, January (1915) at 2s. 3½d. to 2s. 4d., and since at 2s. 3½d. and sellers, January-March at 2s. 3½d. and sellers.

The market for Pará has been firm and dearer, but lately an easier tone has prevailed and prices close rather below the highest. Business has been moderate in Hard Fine, comprising spot and December delivery at 2s. 9d. to 2s. 8½d. and sellers, January (1915) at 2s. 8½d. to 2s. 8½d. and sellers. Soft Fine is dearer, spot closing buyers at 2s. 5½d. and sellers at 2s. 5½d. Negroheads quiet. Manáos Scrappy quoted 1s. 10½d. value, Cametas 1s. 2½d. to 1s. 3d., and Island 1s. 1d. nominal.

Caucho Ball continues scarce on the spot, closing buyers on the spot and forward at 2s. 1½d. and sellers at 2s. 2½d.

In face of these present values it is interesting to call to mind what Mr. C. E. Akers has to say about costs. If his estimates are correct, present values may leave a loss for Brazil, as although the shippers avoid having to pay a dividend or the interest on the cost of bringing the estate into bearing, as has to be done in the East (and this Akers values at £30 an acre as a fair basis, though we have remembrances of much higher figures in many cases), they still apparently, even before the war, which brought higher freights and insurance, had to pay out over 2s. 4d. per lb. before their rubber could be offered for sale in Europe, say†:—

* It is the shortage of hands and the inability to move the cocoa about the Continent by train that is tying up Havre so badly and causing her heavy if decreasing stocks to remain. To ship to London, however, is fairly easy.

† See p. 127 of “The Rubber Industry in the East and West,” by C. E. Akers, Chief of the 1911-12 Commission in connection with the Rubber Industry, price 6s. 6d. net, post free, TROPICAL LIFE Publishing Department.

	Per lb. d.
Cost of maintenance of collector delivering 750 lb. rubber ..	11·7
Administration and owner's disbursements	6·4
Freight to Manáos or Pará	1·0
Commission and charges	1·8
Duties	4·9
Freight and charges to Europe to date of sale	2·5
Total ..	28·3

Whilst this is the average cost price all round, only a certain proportion (50 to 60 per cent.) of the rubber can be classified as Hard Fine, worth, as shown above, 2s. 9d. at most, whilst other kinds are worth less as stated. Against a rough average estimate of 43,000 tons per annum for the three years, 1911-12, 1912-13, 1913-14,* Labroy† and Akers give the following average classification with regard to the quality of the output of the various centres for the 1912-13 exports:—

Labroy		Akers	Tons	Say
Fina ..	63 per cent.	Fina	16,971	51 per cent.
Entrefina	10 ..	Entrefina and Fraca (weak)	8,860	26½ ..
Sernamby (scrap)	27 ..	Sernamby ..	7,400	22½ ..
			33,231	

There is, therefore, some difference between the estimates; but even take Labroy's as giving the greatest percentage of Hard Fine, that still leaves 37 per cent. of the rubber (and Akers's 49 per cent. is probably nearer the truth) to be sold under the price now quoted (2s. 8½d. to 2s. 9d.) for Hard Fine, so that it looks as if present values may only just cover the cost of the entire output, especially with higher transport costs; and if those centres to which the export of British plantation rubber (now well ahead of Brazil as regards output) is prohibited wish to draw supplies freely from wherever they can come, surely prices must go higher before Brazil is likely to increase her exports, as will be necessary if *all* the consuming centres are to secure the rubber they will need. It may also be remembered, on the other hand, that Brazil had a very good cotton crop this year, hence the Cearenses, who contribute a substantial number to the labour supply, had no wish or need to face the hardships of the Amazon forests, but remained at home,† and this must have caused a shortage of labour on the *estradas*, further aggravated by the lower returns secured by those there already, who, if not tied down by debt, have probably gone elsewhere to pick up an easier living until prices improve. To draw such men back to the rubber trees, we feel certain that they must be assured of at least another 6d. per lb., and the owners will certainly want 6d., so that a price equal to 3s. 9d. to 4s. per lb. London terms will be necessary to draw out such increased supplies of Brazilian rubber as will make up the deficiency caused by the prohibition of English plantation rubber to America, Germany, &c. We offer this suggestion and will now sit up and wait to see what others "on the spot" in the West or East have to say in reply.

* Official returns over here, however, gave the 1912-13 shipments as 41,950 tons, and that for 1913-14 as only 39,130 tons. See TROPICAL LIFE for July, p. 138.

† See TROPICAL LIFE for February, p. 32.

‡ Quoting the letter Dr. Willis (formerly Director of Agriculture in Ceylon) sent us. See TROPICAL LIFE for July, p. 138, explaining why Brazil's bumper cotton crop will reduce the output of rubber.

"The Rubber Industry," being the official report of the papers read at the (1914) London Rubber Congress, is now ready, and we can supply same, price 15s. 6d., postage inland 10d., for abroad 1s. 6d. It includes over forty papers read at the London Congress, about twenty read at New York, including those by Mr. Cyril Baxendale, Mr. Wormeley, U.S.A., and the Editor of TROPICAL LIFE, each of whom, therefore, are represented by two papers. Ours, of course are on "Farming with Dynamite" and "The Manuring of Rubber."

Coco-nut Products, &c.

Last month we gave some particulars about the linseed oil market as possibly affecting other vegetable oils. The chief item of news this month *re* same is that the prohibition of the export of this article has disorganized the market and caused prices to be practically nominal and to go much lower, say 25s. to 40s. per ton in a week. Hull naked spot, for instance, is now £20, against £22 2s. 6d. as quoted last week, January-April delivery £21 5s. against £22 17s. 6d.

Coming to coco-nut oil, Messrs. Goodlake and Nutter reported on December 5th that there was a very firm market, as sellers are scarce, and for what little quantity was offered high prices were being asked. Ceylon afloat was offered at 48s. 6d., November-December quoted 47s. 6d., December-January 46s. 9d., and it looked as if buyers would have to come up in their views if they wish to trade. Cochin: Although firm is somewhat inactive. November-December we quote 48s. 6d., December-January 48s. Palm Kernel: Big prices have been paid in Liverpool and we quote spot 49s. to 50s., December 48s. 6d., January-April or January-June 46s. full terms f.a.s. Pressed: There is practically nothing doing in this article at the moment. November-December we quote 42s. and January-April 40s. 9d. f.a.s. London in shipping casks. We quote: Spot Ceylon, £50 to £52; Cochin, £58 to £60.

From elsewhere we learn that the market was firm with Ceylon spot at £50, afloat £48 10s. c.i.f., November-December £48 c.i.f., December-January £47, January-February £46 c.i.f. Cochin spot £60, afloat £50 10s. c.i.f., November-December £48 10s. c.i.f., December-January £47 10s. c.i.f. London pressed November-December £42, against £33 for Palm Oil and £21 15s. c.i.f. for Oriental soya-bean oil in cases, whilst the *Public Ledger* published the following comparative prices:—

	1914.		1913.	
	£ s.	£ s.	£ s.	£ s.
Coco-nut, Cochin, ton ...	60 0	to 0 0	58 0	to 0 0
Ceylon	50 0	„ 0 0	48 0	„ 0 0
Copra	46 0	„ 49 0	49 0	„ 0 0
Palm, Lagos	33 0	„ 0 0	36 0	„ 0 0
Palm-nut Kernel... ..	49 0	„ 50 0	46 0	„ 0 0

There still seem no quotations for soya-beans or cake, but we can give the following:—

Linseed Cake, best London made, £8 17s. 6d. to £9; American, £8 15s. ex Docks; Canadian, £8 10s., as compared with Cotton Cake, best English made, £5 17s. 6d. to £6; Bombay, £5 5s.; Egyptian, £5 15s.

Coming to copra, this has shown an upward movement, due to a good demand and the absence of sellers,

so that the first week in December found the market firm and dearer with quotations for shipment as follows, to London: Ceylon, November-December, £25 15s. buyers, and December-July, £25 10s. Malabar, November-December, £26 buyers, and December-January, £26 paid. F.M.S. Singapore, October-November, £25 5s. buyers; November-December, £24 15s. sellers, and December-January, £24 2s. 6d. South Sea, October-November, £24 10s. value, and December-January, £23 12s. 6d. paid. To Marseilles: F.M. Straits, November-December, £24 5s. buyers, and December-January, £23 10s. Cebu, November-December, £24 buyers. Manila, October-November, £24 buyers, November-December £23, and December-January £22 15s. To Holland: Java, October-December, £27 value c.f. and i.

These prices should be compared with last month's and the increased values noted. At that time Ceylon ran from £23 to £24, and Malabar £23 10s., the others *pro rata*.

Coir yarn realized the following rates: Yarn: Fine at £34, Coconada at £10 10s. Fibre: Ceylon Mat-tress, £9 to £9 10s., and ditto Combing, £14 to £14 15s.

In Ceylon the price of copra has reached Rs. 66 per candy ($\frac{1}{4}$ ton), and the Island papers commenting on this tell us that whilst the output is getting smaller the demand from the United Kingdom is good, and a Colombo broker had expressed the opinion that the active competition was due to the great demand which America was now making for coco-nut oil. It was the custom, he added, for Germany to import large quantities of copra in its raw state, as there is no import duty at German ports on raw products, crush the article for oil, supply herself, and largely meet the demands of other countries, especially America. Now that the war has put a stop to German exports there is naturally a big demand from America, and to supply this England is making a bold bid. Hence the increasing demand from the United States as well as from England, and the tendency for prices to go higher.

Cotton.

London news tells us that the market for American has been dull and declining, fully good middling and middling fair closing 10 points lower, fully middling and good middling 8 points, low middling, fully low middling and middling 3 points lower. The quotation of middling is now 4'35d., whilst futures close dull; May-June delivery quoted 4'09, July-August 4'14, October-November 4'24, and January-February 4'28½, and East India descriptions have been quiet and unchanged.

From Liverpool comes the news that futures, late on December 4th, eased further from midday, and closed quiet at 2½ to 3 points lower on the day. May-June 4'13½d., 14, 12½, 13½, 12½, 13, 12½; July-August 4'18½d., 17, 18; September-October 4'25d.; October-November 4'28½d., 28, 28½, 27, 27½; January-February 4'33d., 32, 32½; whilst only a retail business has been done in American on the spot; quotations of ordinary, good ordinary and fully good ordinary are unchanged; low middling, fully low middling and middling are reduced 5 points, fully middling and good middling 8 points, and fully good middling and mid-

dling fair 10 points. Middling now quoted 4'35d. per lb. Quotations for Brazilian are reduced 5 points. East Indian is unchanged. Egyptian is neglected and quotations are reduced 10 points.

Total sales 4,000 bales, including 500 bales on speculation and for export.

Futures rule dull at a decline of 3½ to 3 points from the previous final level. May-June 4'10d., 10½, 08½, 09; June-July nominal; July-August 4'15d., 13½; August-September and September-October nominal; October-November 4'25d., 23½, 24; November-December and December-January nominal; January-February 4'30d., 28.

The London Cotton Market still being closed, we can give no quotations.

Sugar.

The *Louisiana Planter* for November 21st included some interesting notes on the contemplated inauguration of the railroad ferry, to transfer loaded passenger and freight cars from Key West over to Havana by ferry boats built for that purpose. "Of course," says the *Louisiana Planter*, "it will be presumed that such boats will not go to sea during a great storm, but will be built sufficiently strong to carry their loads across the now reduced distance of some forty miles from the American to the Cuban shore. . . . In addition to carrying these loaded cars with passengers and freight, it has now been suggested that they should receive sugars on the plantations in bulk and carry it to Key West and so on to Philadelphia and New York for sale. Of course, this seems rather impossible . . . the low rates of ocean freights make such railway traffic almost impossible, but, at the same time, wheat is carried all the way from Nebraska and the Dakotas to New York."

Probably, therefore, with sugar at present prices, and the demand that exists for supplies, if the scheme is reasonable enough to start at all, it has an exceptional opportunity to do so now. When the next crop comes along prices may be 25 per cent. or more lower, as critics of the British Government want to maintain that the Government's tactics have caused prices to be unnecessarily high, and if this is true, prices later on should go lower and the sugars then could not carry so heavy a freight as now for the start, when expenses always tend to be higher.

In spite of all the critics the sugar market in London remains unchanged, with a good demand for grocery crystallized. The stock in America is put at 173,000 tons, against 184,000 tons on December 4th, and 93,000 tons only last year; supplies across the Herring Pond, therefore, seem more than ample. Over here the Sugar Commission are holding American Granulated on the spot for 27s. 6d., and White Java for 26s. 6d. to 26s. 9d., whilst American Granulated on the spot sold at 27s. to 27s. 3d. per cwt., with spot Italian Granulated sellers at 26s. to 26s. 3d. Sales lately reported include:—

British West India Crystallized Demerara, low middling yellowish, 26s. 3d.; two lots, 26s. 6d.; good to fine yellow, 26s. 9d. to 27s.; choice, 27s. 6d.

Mauritius, fine yellow grainy syrups realized 22s. 6d.; 16 mats Crystals, 24s. 9d.

White Java on the spot sold at 25s. 9d. to 26s., as to quality, whilst parcels afloat from Java sold at 22s. 7½d. c.f. and i. London.

White Mozambique on the spot fetched 25s. 9d. sellers.

There are spot sellers of White Mauritius at 25s. to 25s. 3d.

Egyptian Crystals on the spot 27s. sellers.

Compared with this, Home Refined sold: Lyle's No. 1 Granulated, 28s.; No. 2, 27s. 6d.; No. 3 Crystals, 27s. 6d.; and Yellow Crystals, 26s. 6d. Tate's No. 1 Cubes, 31s.; Crushed, 28s. 6d.; Nibs, 29s. 6d.; Finest Caster (no quotation); Fine Granulated, 28s.; Standard Granulated, 27s. 6d.; and Caster B, 28s. 3d.; Pieces, 20s. to 26s.

Some of those needing bags are evidently finding trouble to secure supplies. Bahia Blanca (Argentina) in October was troubled about the scarcity of bags for cereals (oats and wheat), and no wonder, since there were then estimated to be 5,000 harvesting machines in the Bahia Blanca zone, requiring a supply of 400,000 bags per day if they were to be kept going at "full speed." Such a demand must affect sugar, coffee, cacao, &c., planters needing sacks, especially as the *Madras Mail* tells us that the Argentine was talking of placing an order for 50,000,000 gunny bags in Calcutta, provided the necessary shipping could be obtained in the immediate future. Argentina for cereals and sugar, Brazil with coffee, Cuba for sugar, all are huge buyers of sacks, and those at other centres will, like the above, be anxiously waiting to see ocean traffic restored and running smoothly in order to assure them supplies. The Continent especially will find it hard work to turn out or otherwise secure all the bags they want.

France meanwhile is bitterly complaining, we hear, of the want of sugar to put into the bags. The *Louisiana Planter*, quoting a French paper, tells us that there are only 75,000 bags of sugar in Paris, against 225,000 in normal times. We gather that although there are eighty-six factories outside the war zone, this shortage will become more pronounced than otherwise, owing to much of the beet area being in the centre of the fighting, and even when otherwise, traffic is so demoralized and so many bridges broken down, that it is often impossible to convey the beets to the factories, even if there is the labour to handle them.

Coffee.

Although the future market has been firm to dearer, prices for December delivery closing 3s. dearer, at 40s. 6d. to 43s. 9d. to 43s. 6d., spot supplies in auction seem to have moved somewhat irregularly, and Dumont Santos was nearly all bought in owing to the absence of demand. Central American sorts, however, sold with fair competition at steady prices.

Receipts in Brazil for the past week amounted to 51,000 bags Rio and 277,000 bags Santos, against 55,000 bags and 287,000 bags respectively for same period last year. The total to date therefore amounts to 5,926,000 bags, against 9,361,000 bags in 1913-14, 7,994,000 bags in 1912-13, and 9,021,000 bags in 1911-12, with exchange at 13½d.

Sales in London during the first week in December included the following business:—

Costa Rica, new crop, low middling coloury, 65s.; bold common to fair greenish, 66s. to 70s.; good coloury, 80s.; peaberry, 82s. to 91s. 6d. Old crop,

fine ordinary mixed greenish and palish, 60s. 6d.; common bold, 64s. 6d.

Guatemala.—Good ordinary mixed greyish, 59s. 6d.; low middling greyish, 62s.; bold common greyish, 65s.; fair dingy brownish green, 68s. 6d.

Vera Paz.—Middling greenish, 68s. 6d.

Salvador.—Fine ordinary to superior foxy greenish, 61s. 6d. to 65s. 6d.; fair bold greyish, 70s.

Colombian.—Pickings, 44s.; small fair to fine coloury greenish, 58s. to 63s.; middling greyish and greenish, 66s. to 66s. 6d.; good middling to fine middling greenish coloury, 67s. 6d. to 71s. 6d.; bold fair to good greyish and greenish, 68s. 6d. to 71s.; fine to very fine, 73s. to 76s. 6d.; peaberry, 60s. to 74s. 6d.

Uganda.—Small fair greenish, 53s.; middling, 59s.; good bold, 65s. 6d.

Dumont (San Paulo), unwashed, very small realized 49s. to 50s.; peaberry, 54s.

San Paulo, unwashed, quay terms, sold at 56s. for good bold brownish green.

Tea.

Commenting on the German tea trade, Messrs. McMeekin and Co. maintain that the average consumption of tea in Germany over the last ten years has been about 8,360,000 lb., but in 1913 the figure had grown to 9,300,000 lb. This indicates an increase merely in proportion to the increasing population. The Indian and Ceylon Associations have spent very large sums for many years in trying to convert Germany into a nation of tea drinkers with an altogether negative result, but it has been alleged that she has been consuming quantities since hostilities began far in excess of any previous records. This is rather a curious and unlooked for development of the war, especially in view of the known efforts to prevent any consumption within the German Empire of tea produced in the Indian and Ceylon dependencies of her chief enemies.

Larger offerings have been catalogued in London, report Messrs. W. J. and H. Thompson, but the demand has been equal to the supply and the trade has absorbed the quantity, without any material alteration in the level of value. Between 8¼d. and 9¼d. per lb. the market has been active, competition being to some extent probably assisted by the Government requirements, and teas coming within this range are firmer; lowest grades, however, are, if anything, a trifle easier, more quotations of 8d. per lb. being recorded. Above 9½d. per lb. prices are irregular, and Broken Pekoes between 10d. and 1s. per lb. are the cheapest grades now selling. The average for the whole sale for Garden Account at the beginning of December was 9d. per lb. for Indian kinds, against the same price (9d.) a year ago, and 9½d. per lb. for Ceylons, against 9¼d. at the corresponding sales in 1913.

The London Cocoa Market.

By THE EDITOR.

THE first week in December saw a marked "jump up" in values, with a still further tendency upward, as can be seen by the closing quotations on p. 240. November closed with advancing prices, including Trinidads at 70s. for superior, Grenadas up to 64s.,

St. Lucia 63s., Jamaica and Dominica at 62s.; but by December 5th Grenadas and St. Lucias had both sold at 70s., fine Trinidads at 74s., and Arriba up to 69s., and higher prices were being asked. Against this compare the prices quoted in our July issue, showing that 61s. was the top price for Trinidads, 56s. for Grenadas, 55s. 6d. for St. Lucia, and fine Arriba about 60s. to 62s. The increased value of cocoa all round, therefore, has been very marked during the past four months, and this will continue so long as exports are permitted. I hope no attempt will be made to check shipments, as, without going into details, although I am quite willing to do so privately, I maintain that these increased shipments are giving two points in favour of this country against one point at the most to anyone else. Those, therefore, who are agitating to have exports prohibited will, I hope, study the position much more fully than their remarks and letters show that they have done up to the present. I believe in whist, if anyone still plays such a game, that so long as you are able to draw two of your opponents' trumps to one of your own, it is a good policy to do so whenever you get the chance. The advantages of allowing the export of cocoa appeal to us as coming within the same category, whilst with rubber the case is entirely different, in fact, it is exactly opposite.

Meanwhile, the native planters on the West Coast of Africa, who got despondent at the news from this side when the war first broke out, are paying more attention to their trees and preparing the cocoa for market now that they hear of the seas being less harassed by the enemies' boats, and also that the market on this side is improving. With the present range of values, which showed, previous to December 5th, an improvement of 10s. or more above the lowest, and since then another 5s. to 8s., these efforts are likely to be further increased. We are still without any particulars as to shipments from the coast to the end of October, or for any month since May, but for October only the Comptroller of Customs at Accra was good enough to tell us the shipments amounted to 2,082 tons, say 4,663,680 lb. This compared with the 7,260,000 shipped last year (63,017,800 lb. at the end of September, and 70,277,800 at the end of October) shows over one-third reduction, and as at that time more attention was being given to the cocoa, as stated above, then the August and September outputs would probably show a still greater deficiency in shipments compared to 1913. On the other hand, the cocoa is there, and though some must be lost by now, and others perhaps deteriorated by the trees carrying too heavy a load of all ages, instead of having the ripe pods removed, yet there must be a heavy output available if it can only be handled and sent down to the coast for shipment. Meanwhile, the latest Liverpool quotations, on December 12th, were at 50s. to 72s., against 38s. to 47s. two months or so back, when they were at their lowest, and this growth, the same as others, tends to go up and will advance so long as the export demand is so strong and supplies curtailed and uncertain. Uncertainty is, of course, a most disturbing element, causing quotations for anything on the spot to be at a premium. At the present moment, although the new crop of Trinidad cocoa has started so well (7,783 bags from October 1st to November 21st, against

6,687 bags last year, and 6,065 bags in 1912), offers seem difficult to obtain, and those who wish to buy cannot get quotations, or if these are forthcoming the cocoa is not, and so it is puzzling to decide what to do or to expect. I believe that is the case with other growths as well. Now that the sea is more open and ships less liable to be interfered with, it is to be hoped that this uncertainty will disappear and prices increase.

The Havre stock has dropped 58,000 bags on the month's movements, being 230,000 bags (in round figures), against 288,000 at the end of October.

I regret to see that the September table of stocks and prices was reprinted in the November issue, instead of those for October, which run as follows:—

<i>Havre Stock, Oct. 31st—</i>		1914. Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Accra ...	...	60,488	66 to 69	33,614	79 to 81
Bahia ...	...	11,264	65 „ 75	3,824	79 „ 84
Venezuela ...	...	83,919	70 „ 200	53,982	85 „ 200
Grenada and B.W.I.	...	1,623	—	1,464	—
Guayaquil...	...	44,987	72 „ 78	15,492	81 „ 86
Haiti ...	...	13,932	58 „ 70	2,636	72 „ 81
Pará ...	...	17,575	67 „ 72	9,143	83 „ 87
San Domingo ...	...	97	67 „ 71	5,725	77 „ 81
Trinidad ...	...	38,876	70 „ 74	20,455	83 „ 87
San Thomé ...	...	3,989	74 „ 75	2,225	82 „ 85
Divers ...	...	11,352	—	12,875	—
Totals ...	...	288,102 bags		161,435 bags	

The mistake, however, will enable my readers to clearly notice which growths have been reduced during the month, as the returns on November 30th were:—

<i>Havre Stock, Nov. 30th—</i>		1914. Bags.	Value. Fcs.	1913. Bags.	Value. Fcs.
Accra ...	...	47,824	—	30,673	—
Bahia ...	...	5,709	70 to 78	2,304	78 to 83
Venezuela ...	...	73,075	75 „ 200	47,624	83 „ 200
Grenada and B.W.I.	...	925	—	1,006	—
Guayaquil...	...	34,310	76 „ 82	15,723	80 „ 85
Haiti ...	...	11,707	62 „ 74	2,370	71 „ 80
Pará ...	...	14,170	73 „ 78	7,782	83 „ 87
San Domingo ...	...	—	69 „ 75	6,242	71 „ 78
Trinidad ...	...	30,417	79 „ 85	18,641	82 „ 85
San Thomé ...	...	3,184	—	3,671	—
Divers ...	...	8,647	—	12,618	—
Totals ...	...	229,968 bags		148,654 bags	

Probably by mid-December, Havre, the same as London, has experienced Fcs. 8 to 10 (or more) rise on above, but we have no advice of this as yet.

<i>London Stock, Dec. 5th—</i>		1914. Bags.	1913. Bags.	1912. Bags.
Trinidads ...	...	6,999	10,660	5,189
Grenadas ...	...	2,826	2,966	2,659
Other W.I. ...	...	3,852	3,240	5,565
British W. Africa	...	4,010	4,564	4,280
Portuguese W. Africa	...	2,782	5,970	5,686
German W. Africa	...	762	2,573	8,122
Ceylon and Java ...	...	10,140	9,265	8,570
Guayaquil ...	...	21,916	19,940	24,065
Brazil and Bahia	...	1,957	2,127	3,997
Other Foreign ...	...	8,411	8,927	6,633
Totals ...	...	63,655	70,232	74,766

The Board of Trade figures to the end of November show the deliveries for the December home consumption to have been less than one expected with the war now on, which should have increased the deliveries both for the Government as well as private factories. Although ahead of last year's demands, that is nothing to be proud of, it is the figures for 1912 that I should

like to see exceeded. During November alone 2,548 tons were delivered for Home Consumption, against 2,148 last year and 3,061 tons in 1912, making the eleven months' totals work out as follows. (Note the increase in exports: during November only these amounted to 2,537 tons, against about one-sixth last year, viz., 446 tons, and 633 tons in 1912):—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Nov. 30th) Tons.
Jan.-Nov., 1912—	29,718	25,214	5,864	8,141
„ 1913—	31,576	25,154	6,304	8,848
„ 1914—	37,911	25,830	9,005	12,739
Incr. 6,335		Incr. 676	Incr. 2,701	Incr. 3,891

Foreign Manufactured—	Nov. only Imported.	Del'd H.C.	Jan.—Nov. Imported.	Del'd H.C.
1914 ...	634 ...	602 ...	8,840 ...	8,740 tons
1913 ...	970 ...	944 ...	11,512 ...	11,028 „
1912 ...	1,159 ...	1,213 ...	9,462 ...	9,615 „

Last month I gave the 1913-14 crop figures for Trinidad, this month I can include those for Grenada, say:—

Oct. 1-Sept. 30	To Europe	To U.S.A.	Total Bags
1913-14 ..	49,294 ...	17,608 ...	66,902
1912-13 ...	43,487 ...	19,989 ...	63,475
1911-12 ...	55,546 ...	14,548 ...	70,094
1910-11 ...	54,644 ...	12,500 ...	67,144
1909-10 ...	63,124 ...	10,739 ...	73,863

Including the sales held on December 8th, when prices advanced 8s. to 10s. for Grenadas and other West Indies, 6s. to 7s. for Trinidads, 8s. on Bahias (and it would have been more had a nice lot of superior been offered), 8s. to 10s. on Guayaquil, on previous public sales, but only 1s. to 2s. for Grenadas and St. Lucias on business done privately over the week-end, values work out as follows:—

Trinidads.—Mid. to good mid. red sold on December 8th at 72s. to 73s., making good to fine worth 74s. to 76s. Previous to December 5th, fine good red sold at 74s., against 70s. for Grenada and St. Lucia.

Grenadas.—Good to fine marks, 71s. to 72s.; fair good fair reddish, 70s.; ordinary unfermented are valued at 69s. Later fine marks touched 73s.

Jamaicas.—No really fine offered. Good red sold up to 72s. 6d., and fair common at 62s. to 65s.

St. Lucias.—Fair common realized 67s., good reddish to fine marks would be worth 69s. to 72s.

Dominicas.—Good to fine fetched 69s. to 70s., ordinary unfermented to fair 66s. to 68s. 6d.

Bahias.—Fair wormy realized 66s., but fine superior should realize a price fully equal to fine Grenadas, as they are scarce and uncertain as to output.

Samoa.—A mixed lot of “many colours like Joseph's coat,” but not unsimilar in break, realized 74s. 6d. to 80s. for the best, whilst dark to fair medium went at 68s. to 73s. Interesting as a study of how a single grade can be made up to resemble other kinds, the outer appearance of the bulk was not as attractive as it might have been.

British West Africans have been dealt with in the body of the report.

Guayaquils sold at 71s. to 72s. for Caraquez, 73s. Balao, 71s. 6d. Machala, 76s. for mixed Arriba, and 77s. for Summer Arriba, showing all round a rise of about 10s. on previous business done.

Ceylons are firm to higher, ordinary 64s., fair medium 66s. to 69s., good medium 72s. to 75s.

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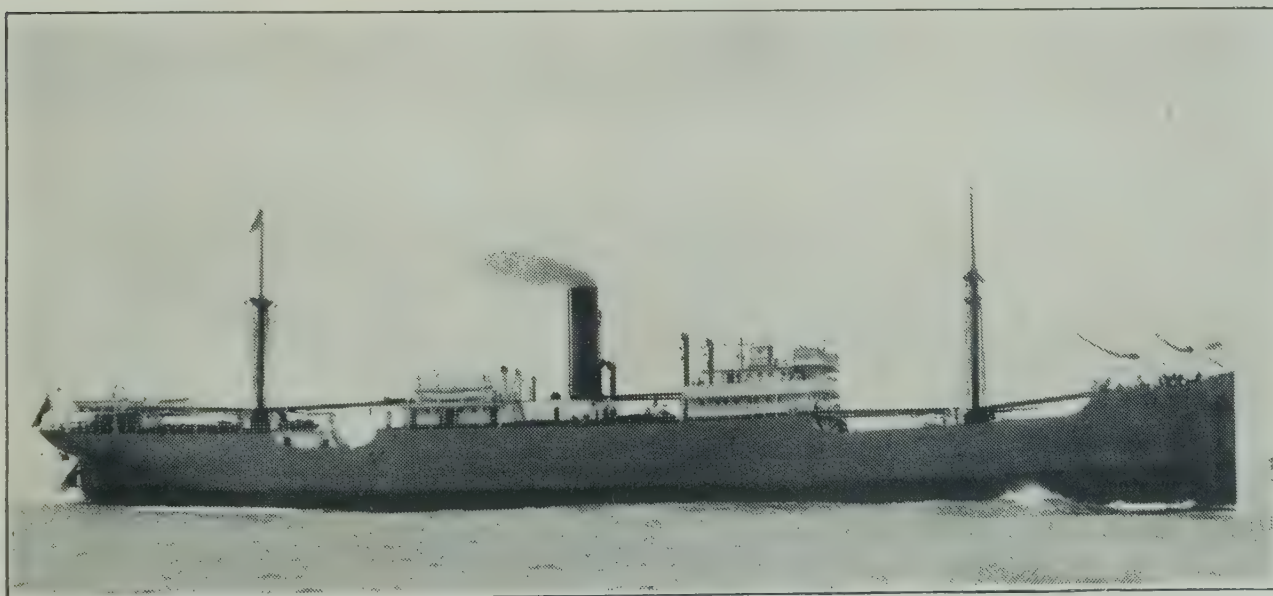
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The Fermentation of Cacao.

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L'Institut Colonial de Marseille issued a special report on the studies undertaken in connection with coffee, cacao, sugar and tea. In this important publication the section on cacao is entirely devoted to a discussion of the above book, and especially on Mr. Hudson's contribution on "Le Traitement mécanique du Cacao."

"**De Indische Mercur**," of Holland, of October 7, 1913, published a long notice on the book, concluding with the remarks that: "No pains have been spared to make the book as perfect an issue as possible."

"**Der Zeitschrift für Untersuchung der Nahrungs und Genussmittel**," of Berlin, also issued a special pamphlet (17 pages) in which the book is discussed.

"**Les Annales de Gembloux**," Belgium, says:—"Il serait vraiment à souhaiter que tous les planteurs se rendent bien compte, comme le démontre l'auteur dans les considérations qu'il émet à propos des données des travaux publiés, que le mot d'ordre doit être 'standardisation.'"

"**The Bulletin of the Agricultural Society**" (Trinidad, B.W.I., the Home of Cacao).—"The book deserves special mention as it fills a long-felt want, and should be the means of disseminating much valuable information where, it is to be hoped, it will bring forth fruit abundantly."

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IT has been truly said that, owing to the European war, one of the most epoch-marking events, more important perhaps than even the discovery of America, was passed by unnoticed by the English public when the Panama Canal was officially opened on August 15th. "There has been no geographical event of importance equal to that of the cutting of the canal since Columbus gave to man the 'God-like gift of half the world,'" says one authority,* whilst the Hon. John Barrett, Director-General of the Pan-American Union at Washington, one of the guests on board the "Ancon," whose voyage through the canal constituted the official opening, starts his report of the ceremony in the issue of the Pan-American Bulletin with these words: "August 15th, 1914, will always remain one of the notable dates of history; on that day the Panama Canal was opened to the commerce of the world."

Since this is the opinion of others as to the value of the canal, why has the event made so little, if any, impression on the mind of the man-in-the-street of London? Why did the papers devote less space and attention to this event than they did to the death of the late Pope and the election of his successor? "On account of the war" do you say; but that cannot be, for surely it is the war, above everything, that should centre the attention of England on the canal. Think of the thousands of miles and of the valuable days and weeks that can be saved when we are hurrying our ships home, warships or merchantmen, or if the captain of the "Emden," now, fortunately, placed *hors de combat*, had wanted to flit across the world after having been too troublesome in the Atlantic, Pacific, or elsewhere. In the face of this those who are indifferent to the importance of the canal must indeed be made of very poor stuff.

Outside of war and trade politics, however, we simply cannot afford to overlook the importance of the world-wide changes that this junction of the Atlantic and the Pacific is bound to bring in its train. Those in the trenches or behind the quick-firing guns that are so surely, if slowly,

driving the German military maniacs back to the one spot on earth they wish to avoid—i.e., Berlin—could well compare the spit-spit of their bullets to the whirr-whirr of the "Ancon's" screw as she also steadily and slowly wended her way from ocean to ocean, overcoming and avoiding all the impediments in her way, as the allies in France and the Russians in East Prussia are doing in Europe. May these armies soon march into and meet at Berlin and so bring peace and prosperity to the world again, as the "Ancon's" voyage will help to do by passing from the waters of the Atlantic to those of the Pacific. We are, however, not writing for the world at large but for the West Indies in particular in the hopes of making our readers (especially members of the British Chambers of Commerce overseas) and others realize what this "meeting of the waters" must mean to the future prosperity of those islands in which this country has the heaviest stake, and how the increased wealth that the Panama Canal will bring to them will also directly or indirectly affect the hub of the Empire.



GATHERING CACAO IN DOMINICA.

* Professor Vrooman at the Royal Colonial Institute, see p. 4.



BREAKING CACAO IN GRENADA, AN IMPORTANT PRODUCING CENTRE.

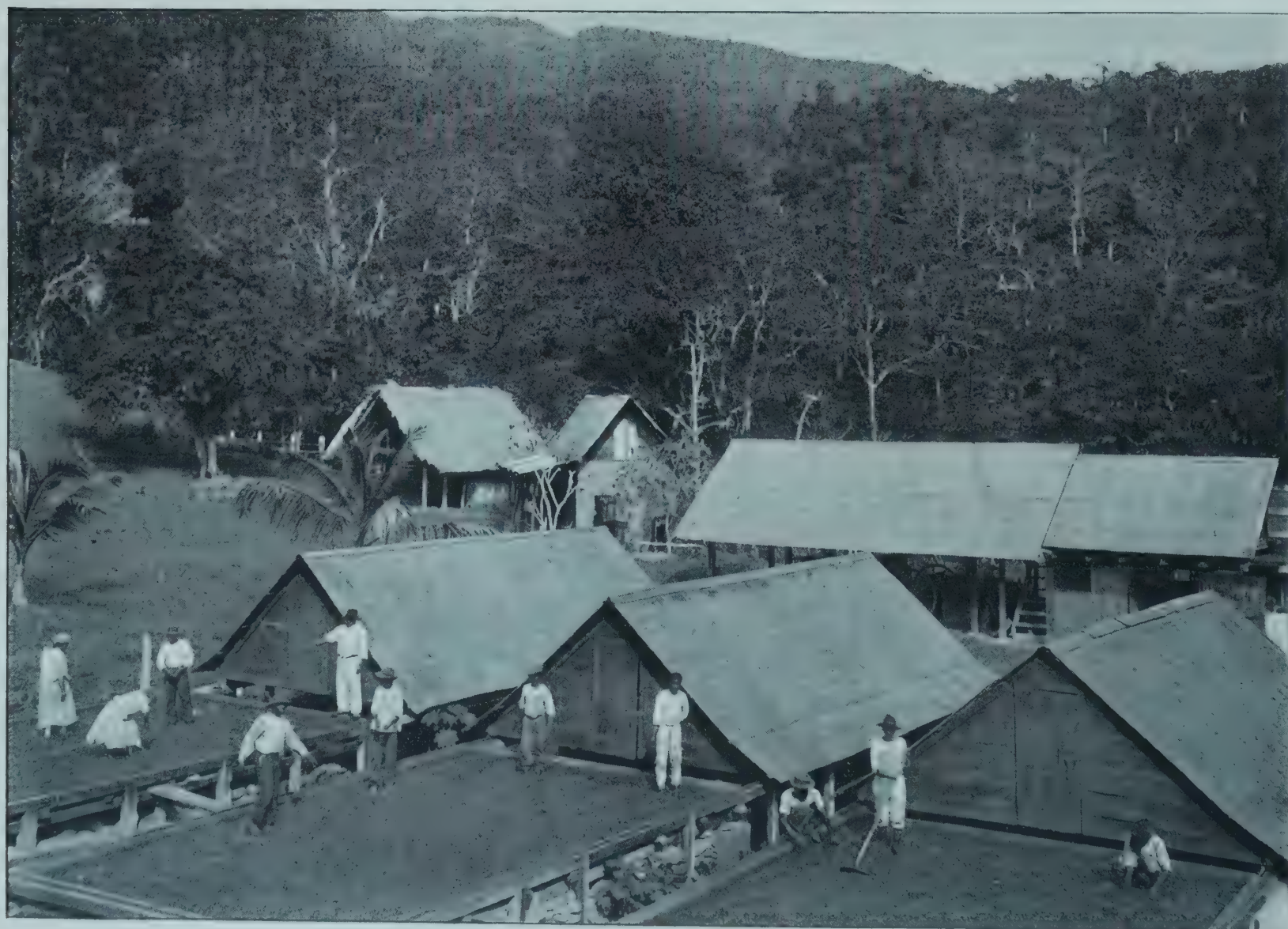
Dun's Review, of New York, in the account of the ceremony that appeared in its issue for October under the title of "What the Panama Canal means to South America and the Orient," tells its readers that "The opening of the canal has brought more than half the countries

hearken. Again referring to 'Professor Vrooman's paper, which all should read and study,* he tells us that

* Entitled "The Economic Effect of the Panama Canal on Western Canada," being a paper read before the members of the Royal Colonial Institute and published in their organ, "United Empire," for July, 1914 (p. 561 *et seq.*).

of the globe many miles closer to each other. In some cases the time of the voyages between the ports has been reduced by half. New York to Yokohama is 3,768 miles, and to Shanghai 1,876 miles less, thanks to the canal, whilst Sydney is 4,000 miles nearer, Melbourne 2,770, Adelaide 1,746, and Wellington 2,500 miles closer." If this is so with New York, London, with her children dotted over the world, must benefit to an even greater extent, whilst the British West Indies, as rest-houses, or on account of their coaling stations, dry-dock accommodation, &c., are bound to benefit as much as any centre and far more than most.

Some of our countrymen fortunately have fully realized from the start what the canal will mean to this country and her possessions. The facility with which it will enable West Indian produce to reach San Francisco, West Canada, and the East, has been pointed out and marked by those who have been willing or wide-awake enough to



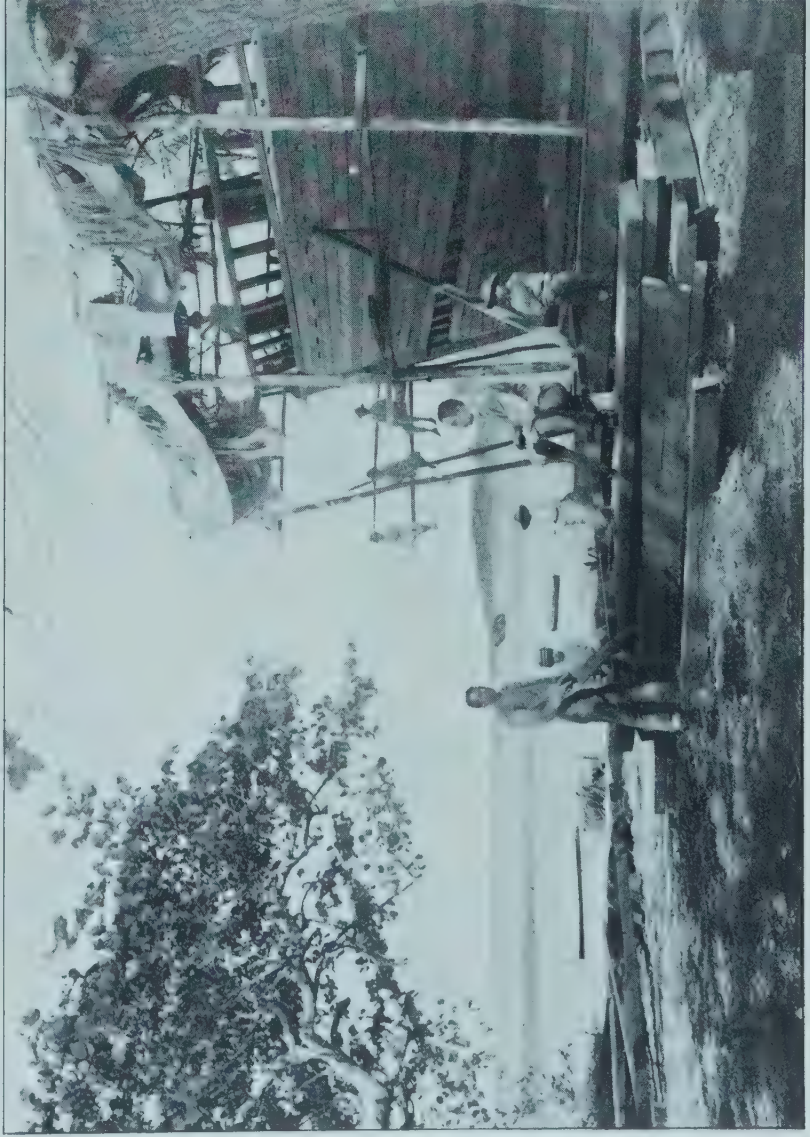
DRYING AND "DANCING" CACAO IN TRINIDAD, WHICH SHIPPED 318,000 BAGS AS HER LAST CROP



RUBBER (on the left), COCO-NUTS (in centre), AND CACAO (on right) IN TRINIDAD.



DRYING CACAO ON A BOUCAN OR DRYING FLOOR.



THE CANAL SHOULD INCREASE SHIPBUILDING IN THE WEST INDIES.



COCO-NUT PALMS AT PORT ANTONIO, JAMAICA.



A LIME FACTORY IN MONTSERRAT.



TOBACCO PLANTATION NEAR KINGSTON, JAMAICA.



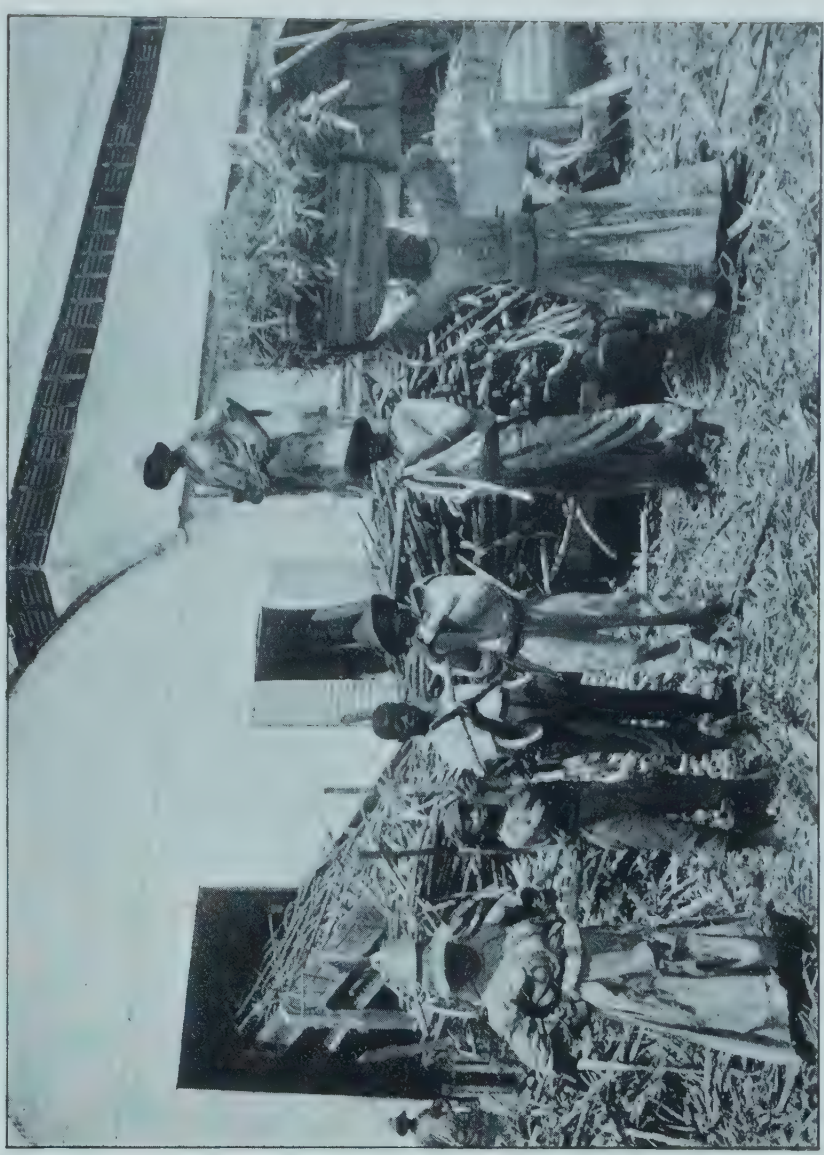
CARTING LIMES IN MONTSERRAT.



LOADING TRUCKS WITH ASPHALT, PITCH LAKE. TRINIDAD SHIPPED 208,164 TONS LAST YEAR.



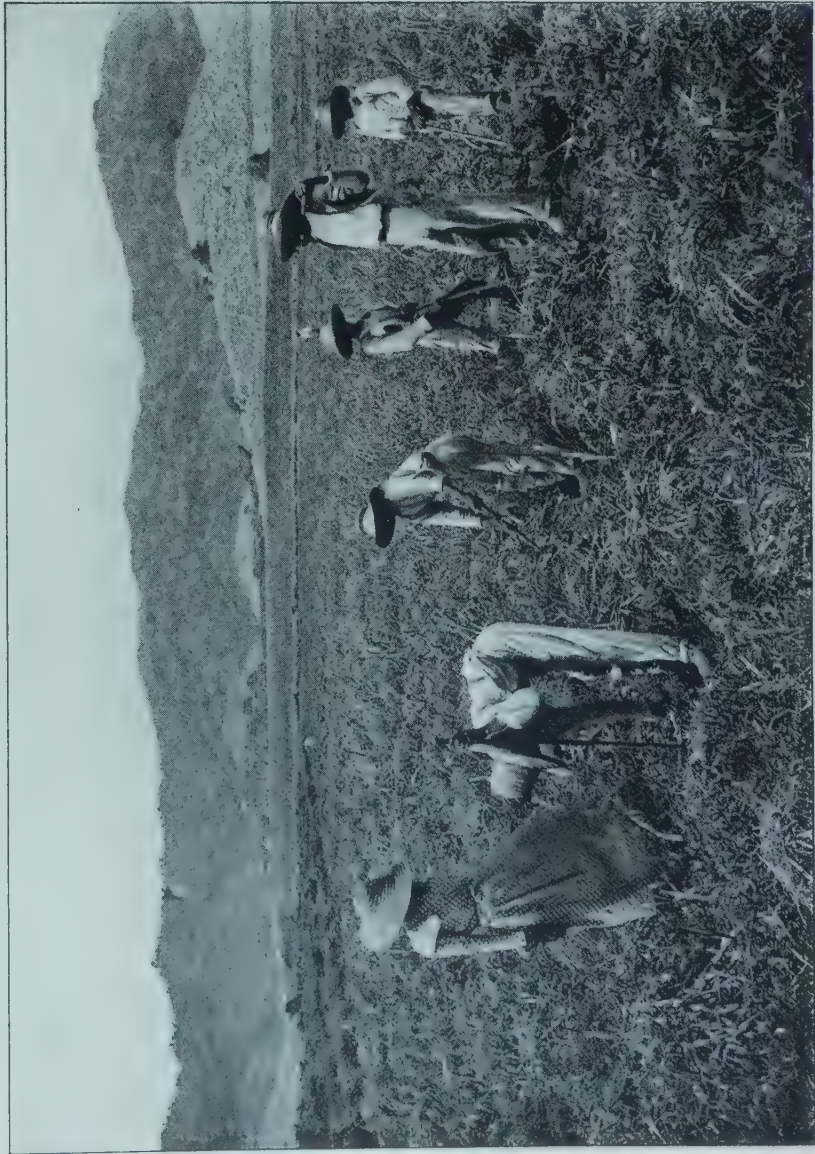
STE. MADELEINE, THE LARGEST SUGAR FACTORY IN THE B.W.I.



UNLOADING CANE ON A JAMAICAN ESTATE.



COLLECTING AND CARTING CANE ON A JAMAICAN ESTATE.



WEEDING AMONG THE YOUNG CANE IN MARTINIQUE.



CATTLE PEN IN ST. KITTS.

"There has never been an intellectual awakening in any one generation in the history of the world that can be compared with that of Asia. This, and the opening of the canal, constitute two revolutionary movements which are happening simultaneously—in our own time and on the Pacific Ocean. Do you know what it all means? It is no longer necessary to recapitulate aggregates of the millions of miles and the millions of years to be saved in actual sailing distances and time, by reason of the new canal, for us to realize that the economic equilibrium of the world is soon to sustain an up-shaking. But it is not generally known that so profound is the change to be wrought in Canada that the Panama Canal is already throwing up across the Dominion a new economic continental divide. . . . It means that the Panama Canal will put an Alberta farmer in the summer about seven cents and in the winter fifteen cents a bushel nearer Liverpool. . . . It is easy to see (to say nothing of the miner and manufacturer, who will equally share in the unearned dividend) for the farmers of Alberta and Saskatchewan a free gift from this canal of something in the neighbourhood of £50,000,000 a year in *freight rates saved*."

And so the tale goes on, as told by those able to realize the enormous value that the opening of the canal must be both to east and west; and yet, in spite of this, there are many who wish to maintain that the canal will bring no benefit to our West Indian Isles. We can only say that those who think so do not deserve to own such gems; like the man who buried his talents of silver, they deserve to lose them, or at any rate to lose any interest or increased value in the islands that they are fortunate enough to possess.

Believing so, we were glad to come across a new book on our West Empire entitled "Life and Adventures in the West Indies," by "Vaquero,"* who apparently has no doubt as to the increased value the traffic and trade

of the Canal itself will bring to the Islands if only by opening up to them the enormous advantages that they will derive from the direct traffic with the western coast of America, especially San Francisco, the Canadian ports, Australasia, with its increasing chocolate-manufacturing industries, as well as Japan, China, and the East generally. In the short preface the author says that "The predictions made in the former volume† relative to the results of the monopoly of the Panama Canal, and to the desirability of having an international waterway, have already been verified by the dispute about the canal-dues, and by the action of the United States in entering into negotiations for a suzerainty over Nicaragua for the purpose of preventing other nations from using this alternative route. Owing to such unremitting American activity which is fast absorbing the Spanish-speaking Republics, Great Britain cannot afford to neglect her West Indian Islands, which are so near the scene of these vast changes that they must be implicated in them." With these views

we quite agree, especially as, owing to the war, the opening of the Canal must have an increased importance as a connecting link between the eastern and western tropics, and especially with Japan; the traffic to and fro that will result cannot but create a substantial increase in the demand in most of the West Indian Islands for offices and stores, dry dock accommodation, fuel, provisions, ships' stores, &c., as well as increased traffic in the ordinary import and export goods. On this account we hope Vaquero's book on the West Indies will be carefully studied, as it deals with the life of the working and peasant classes almost entirely, and does so in a way that we have not encountered in any similar work. The illustrations we reproduce in this issue, by the courtesy of the publishers, give a good idea of the diversity

† "Adventures in Search of a Living in Spanish-America. Price 8s. post free. Same publishers (Messrs. Bale, Sons and Danielsson).



COOLIES HUSKING COCO-NUTS IN TRINIDAD.

* 284 pp., with many maps and 110 illustrations. Price 10s. 6d. net. John Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, Oxford Street, London, W.

and importance of the industries carried on over there, industries, it must be remembered, that can be added to considerably with advantage to those carrying them on as well as to the buyers of their produce—we refer to vegetable growing, poultry raising, maize and rice cultivation, cattle and hog breeding, &c., as discussed and recommended in our book on "Coco-nuts."* Already the demand for such foodstuffs far exceeds the supply, and what it will be when the Panama Canal becomes the "London Bridge" of the west it is impossible to estimate.

This is why we are so anxious to see "Vaquero's" book enjoy a widespread circulation, as it can show the small capitalist that there is more money to be made in those islands than elsewhere if you work steadily, do not try and live "too high," and put your mind thoroughly into your work.

Having read "Vaquero's" book describing the general conditions of life in the West Indies, those wishing to study their economic and historical side should apply to the publishing department of the West India Committee at 15, Seething Lane, London, E.C., for such books as Aspinall's "Pocket Guide to the West Indies," 1914 (3rd edition, price 5s. 4d.; his "West Indies and Guiana," cloth,

* Price 13s. 6d. post free. TROPICAL LIFE Publishing Department.



DAIRY AT THE GARRISON, BARBADOS. DAIRY-FARMING IS AN INDUSTRY THAT SHOULD BE EXTENDED THROUGHOUT THE WEST INDIES.

1s. 3d.; "The British West Indies," 8s. 6d.; "West Indian Tales of Old," 5s. 6d.; also "The Banana," by Fawcett, ex-Director of Plantations in Jamaica, 8s. 3d.; "Cacao," by Hart, 8s.; as well as the following hand-books: "Barbados," 3s.; "British Guiana," 2s. 6d.; "Jamaica," 7s.; "Trinidad and Tobago," 9d.; "Jamaica in 1912," 9d.; "Tobago," 4d.; "Trinidad and Tobago in 1913," 1s. 6d. All prices include postage.

All the foregoing blocks, as well as many others, appear in "Vaquero's" book, and have been lent to us by the publishers.

TROPICAL SANITATION AND THE DIS-INFECTION OF CLOTHING.

MENTION of the Panama Canal immediately calls to one's mind the strides forward that have been made in the science and practice of sanitation and hygiene within the torrid zone under the supervision of Colonel Goethals, who was placed in charge of the Canal whilst that area was being drained and "cleaned up," and who still reigns supreme there.

Working on similar lines in the West Indies and elsewhere, men like Sir Patrick Manson, Sir Ronald Ross, the late Sir Rubert Boyce, Edward Ross, and many others have done immense good both in showing how malaria, yellow fever, and other "ills that man is heir to," can be avoided, and also, perhaps especially, in pointing the way how even the lowest class negro, East Indian coolie, Chinese labourer, or Tamil can, by keeping his house and yard clean, be fairly immune from trouble to themselves, and therefore no longer a channel of contagion to his white neighbours and employers.

No department of the work of tropical medicine can exceed in importance in this work that of combating parasitic and insect pests such as rat-fleas, mosquitoes, lice, &c., and as Boyce points out as the opening words to his "Mosquito or Man?"* "Undoubtedly it is to the genius of Pasteur and to his discoveries in bacteriology and epidemiology that we must ascribe the foundation of the present investigations in animal parasitology and their application to the cure and prevention of tropical diseases." In confirmation of this, as we showed



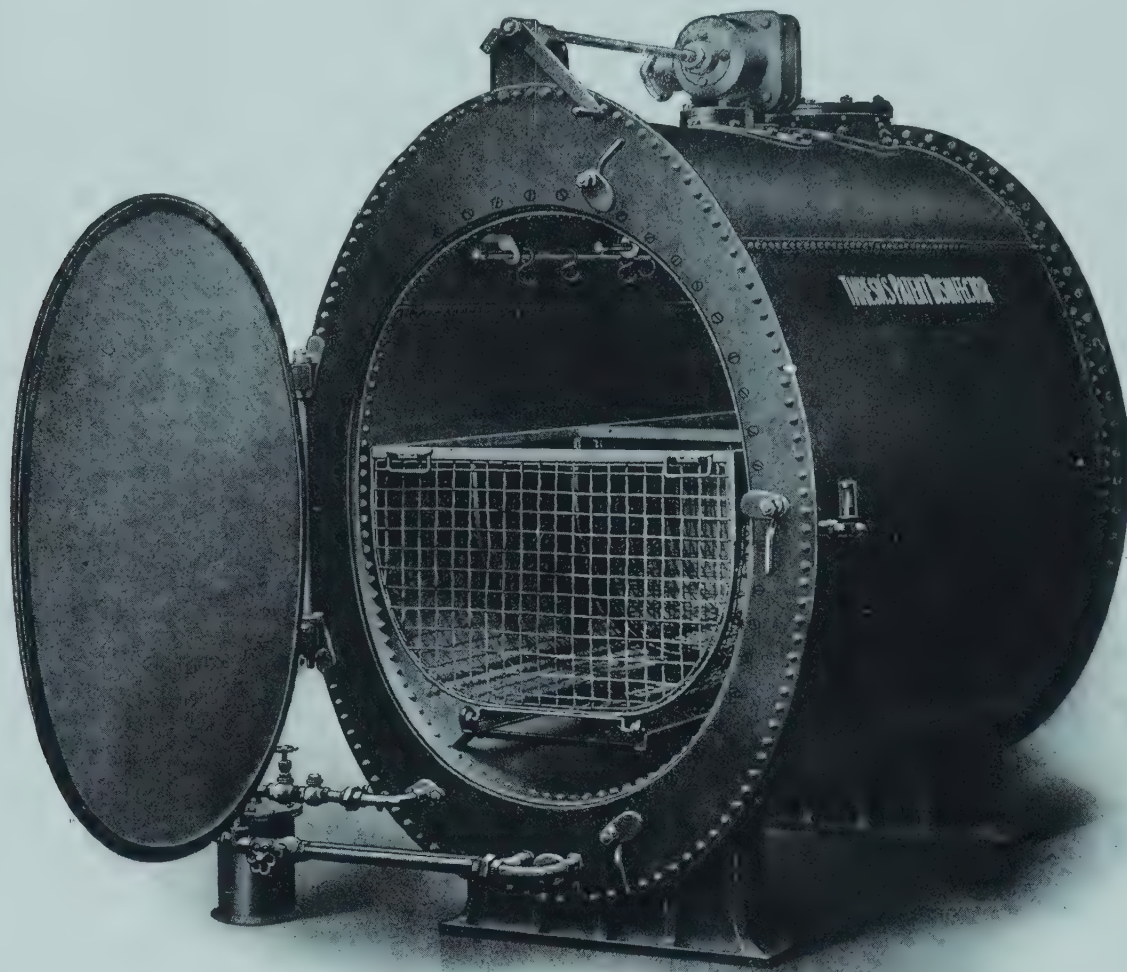
A BRITISH TURCO—A SOLDIER OF THE W.I. REGIMENT.

recently, the 1912 Report of the Tropical Disease Board of the Philippines tells us that "the more rapid the eradication of the idea that the tropical climate *per se* injuriously affects the nervous system, the more rapid will be the decrease of such mild forms of neurasthenia and irritability as are due largely to a preconceived dread of the effects of tropical disease."*

In plain English this means that if the resident in the Tropics can keep insect, parasitic, bacillic, and other pests at arm's length, he need have no more fear of living in the Tropics than in many or any places in Europe or the United States of America. Personally we consider that there are many spots on this side of the water which are far more inimical to one's

chambers for the treatment of the soldiers'—well or wounded—clothing is now recognized as one of the main reasons why this horrible war has not been worse on account of the contagion from man to man or wound to wound that has always prevailed in previous wars.

The latest instance of this has been exemplified by the news that the Russian Ministry of Ways and Communications is sending to the front a "bath train" of over twenty cars, providing 2,000 baths daily. There is a tank car in case water is unobtainable at any stopping-place. Soldiers can be given clean underclothes from the stores carried, and *there is also a car for drying and disinfecting outer garments* and a food car.



The above shows the stationary type of "Thresh" Current Steam Disinfecter, working at atmospheric pressure; it represents the steam-heated machine, steam for disinfecting purposes being obtained from an independent boiler. The same pattern is made for heating by a furnace fixed beneath the disinfecter where no steam boiler is available. In the furnace-heated pattern the method of disinfection is exactly the same, the steam for disinfection being generated in the machine itself instead of being obtained from a steam boiler. These machines are made in various sizes from 3 ft. 9 in. long by 3 ft. 9 in. high by 3 ft. wide, capacity 33 cubic feet, to 8 ft. long by 4 ft. 6 in. high by 3 ft. 6 in. wide, capacity 100 cubic feet. The machines are made with door at each end or door at one end only as required. Double-door machines are preferable, as infected linen can be isolated from treated linen.

health than are the Tropics taken as a whole, whilst the Canal zone, since "King" Goethals has been in charge there, proves beyond doubt what further improvements can be carried out once you keep the pests away, or, better still, catch and kill them.

In this, the extermination of human and other parasites and pests, the modern disinfecter is playing as leading a part inside the houses as the mosquito gauze and the petroleum gangs have played in the exteriors of tropical dwellings; and not only in the Tropics but here in Europe the disinfecting

A man, or his clothing, is said to be infected when he, or it, is contaminated with living insects or germs capable of producing disease (pathogenic microbes) and the object of disinfection is to cause the death of these microbes. Articles in common use are almost invariably contaminated with microbes, but most of these are not capable of producing disease—thank goodness. Many microbes have, however, the power of giving rise to putrefaction and other kinds of fermentations, and so should, in fact must, be destroyed if the health of their host is to be maintained; hence the need of disinfecting apparatus of a suitable and effective type, for there are some microbes which are much more difficult to kill than municipal and other authorities credit them with being

* "Practical Tropical Sanitation." By Alex. Muirhead. TROPICAL LIFE. London. 10s. 6d. net. See TROPICAL LIFE, October, 1914, p. 193.

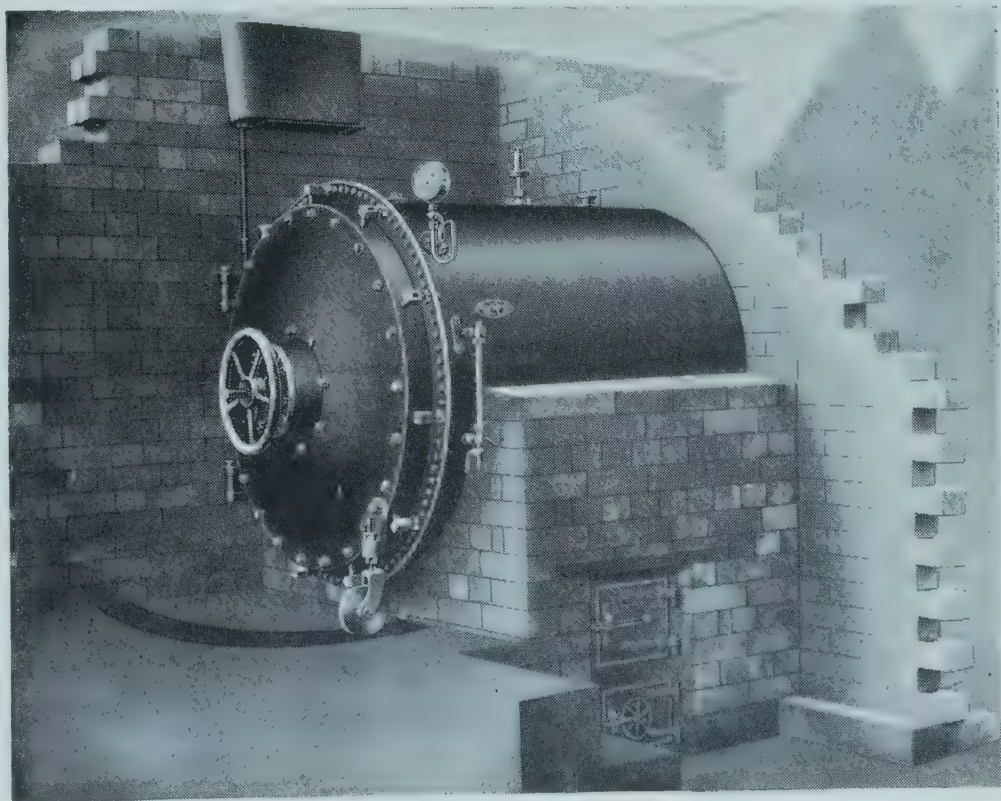
and which, unless got rid of, will continue to spread and increase the trouble and expense their presence always brings. Those who doubt this should turn to modern works on tropical

sanitation and note the hopeless and helpless fatalism of our grandfathers' and fathers' times, compared with the robust certainty of the modern scientist, who, far from feeling that he is going to assured death, or, at the best, helpless debility, knows that he is going to certain health and continual activity, exactly as if he remained over here. "With the exception of Beauperthuy, Finlay, Harrison, Sutton Moxly, Nott, Carter, and a few others," wrote Boyce in his 'Health, Progress and Administration in the West Indies,'* "doctors gave up speculating upon the origin of yellow fever, and resigned themselves to the inevitable; they spoke of 'death blasts,' 'abodes of death,' 'yellow fever houses,' 'yellow fever envelopes,' 'sections of yellow fever climate,' and 'the something' which the new arrival in a tropical country carried with him, which, when it came in contact with the new conditions of tropical life, caused a veritable yellow-fever explosion. The day of deliverance, however, came when Manson, Ross, Reed, Carroll, Agramonte, and others, proved that mosquitoes conveyed the fevers—malaria, yellow, filaria, &c." This is perfectly true, and as it was, and is, with yellow fever and the stegomyia mosquito, so it has proved to be with the anopheline mosquito and malaria, the *culicidæ* and dengue fever and filariasis, the plague and fleas, and the septic fly and typhoid fever, tuberculosis, cholera, &c. To minimize, therefore, the harm that these insects and a host of parasites and bacilli can do to man, especially "whites," in the Tropics, science has declared war on the pests, and first among the appliances called upon to help her was the modern disinfecting apparatus. If Colonel Goethals worked in the open night and day to prevent the pests from breeding and spreading trouble around, the house operator was equally busy spraying down and otherwise disinfecting the buildings (inside and out), and, above all, in thoroughly disinfecting and sterilizing the clothing and other contents of the houses, leaving the patient himself to the care

* TROPICAL LIFE Publishing Department. 10s. 6d. net, post free.



The above shows the "Mackenzie" spraying machine in operation. This sprayer is used by most of the local councils in England for disinfecting rooms after infectious cases have been removed, and is much used for periodically spraying the floors, walls, ceilings, furniture, &c., in hospital wards, schoolrooms, &c. It is found invaluable for estate and other hospitals, or wherever it is necessary or advisable to periodically spray the interior of any kind of building, especially in warm and tropical climates, for the purpose of preventing contagion. It is easily worked by one operator, and with careful use there is absolutely no damage to the articles sprayed. Those used to spraying machines will understand that it is not necessary to continually work the pump of the machine. By a few strokes only, a spray is obtained for some time, and by a few movements of the pump handle at intervals this spray may be continued. A larger size, with fittings specially designed for use in lofty rooms, factory buildings, &c., is also supplied.



Here we have a type of the "Thresh" machine working at low steam pressure; this is a furnace heated machine. This pattern is also made suitable for working with steam from an independent boiler. The machine is made in sizes from 3 ft. long by 3 ft. 7 in. diameter, to 8 ft. long by 3 ft. 7 in. diameter, fitted with door at each end or one end only as required.

of the nurse and doctor. River bank and stream, roadway and yard, walls and flooring, man and his belongings, each and all to-day are treated, nothing is allowed to escape, and the book under review shows how the last named (the clothing and household goods) can be rendered free from contagion if the methods described between its covers are accurately and carefully carried out; for in their book on "Disinfection and Disinfectors" * the Thresh Company† discuss the different methods by which clothing, &c., can be thoroughly and safely disinfected so that they can be used again with safety and thus put the owners or the authorities to the least possible cost or annoyance. Steam, heated temperatures, saline solutions, super-heated steam, &c., are each discussed in turn, and the various apparatuses illustrated and explained. Reports by leading authorities, as Professor Sims Woodhead, M.A., M.D., &c., and Professor S. Delépine, M.Sc., M.D., are included, and the whole question of the disinfection of clothes, &c., analysed, the cost estimated, and the beneficial results shown by means of charts and tables.

As regards the means by which perfect disinfection can be secured, the one, perhaps, that is most generally adopted or discussed is that which disinfects or sterilizes the goods by steam, which, whenever applicable, has hitherto proved the most reliable agent. To carry out the operation successfully steam at a temperature not exceeding 126° C. is particularly suitable for the disinfection of bedding, clothing, woollen, cotton, or linen articles (say sheets, blankets, native garments, clothes, &c.), and even household, factory or hospital utensils, instruments, &c., that had come into contact with a contagious subject. On the other hand, vessels, utensils, &c., made of or containing leather, rubber, glue, &c., being all more or less liable to serious damage by the action of steam, that medium cannot always be used.

* This book has been published for free distribution among those who are *bonâ fide*—interested in tropical sanitation and hygiene. It cannot be too carefully studied by city and municipal authorities, military or civil, superintendents of city or estate hospitals, or anyone having a number of workpeople under their control.

† The Thresh Company, Export Dept., 4, Central Buildings, Westminster, S.W.



Here is shown a range of five portable machines supplied to one order, for use in the Tropics. The machine in action is similar in every way to the machine first illustrated in this article, but is, of course, furnace heated. The portable machine can be made with shafts for horse traction, or, where desired, a pole substituted for bullock draught. The machine is made in two sizes, with disinfecting chamber 3 ft. 9 in. long by 3 ft. diameter, capacity 26½ cubic feet; and 5 ft. long by 3 ft. diameter, capacity 35½ cubic feet. For hilly districts the larger size can be fitted with four wheels instead of two wheels, as shown in the illustration. It should be understood that after the process of disinfection has been carried through, the disinfected articles may be dried in the machine. By a simple manipulation of valves the process of disinfection may be discontinued at the moment required and drying commenced.

Whilst, with confined steam, penetration takes place very slowly, with current steam at ordinary atmospheric pressure five to fifteen minutes' exposure only is required to disinfect products containing pathogenic bacteria of a resistance not exceeding that of the spores of the *Bacillus anthracis*, the difference in the time needed being due to the variations in the amount and kind of associated material. If, on the other hand, it is desired to secure complete bacilli, at least two and a half hours' exposure should be allowed, and even two and three times that period. Space however forbids us to go into details here, but those who secure a copy of the book will be able to study them *in extenso*.

We trust, therefore, that the authorities and others will hasten to secure copies of this book and study its contents, as by doing so they will increase their reputation, save money to those employing them, and benefit the health of the communities under their charge.

Cacao, Rubber, Coco-nut, Tobacco and other Planters, and those interested in Tropical Agriculture and the Tropics generally, should subscribe to
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